SOIL SURVEY OF

Clay County, Mississippi

United States Department of Agriculture
Soil Conservation Service
In cooperation with
Mississippi Agricultural and Forestry
Experiment Station

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in the period 1969-73. Soil names and descriptions were approved in 1973. Unless otherwise indicated, statements in the publications refer to conditions in the county in 1973. This survey was made cooperatively by the Soil Conservation Service and the Mississippi Agricultural and Forestry Experiment Station. It is part of the technical assistance furnished to the Clay County Soil and Water Conservation District.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Clay County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification and woodland group of each. It also shows the page where each soil is described.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the capability units.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for dwellings, industrial buildings, and for recreation areas in the section "Engineering Uses of the Soils."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain estimates of soil properties and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of Soils."

Newcomers in Clay County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the information about the county given in the section "General Nature of the County."

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Summary of Tables

SOIL SURVEY OF CLAY COUNTY, MISSISSIPPI

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION

CLAY COUNTY is in the east-central part of Mississippi (fig. 1) and has a land area of 264,960 acres, or 414 square miles. West Point, the county seat, is the largest town in the county.

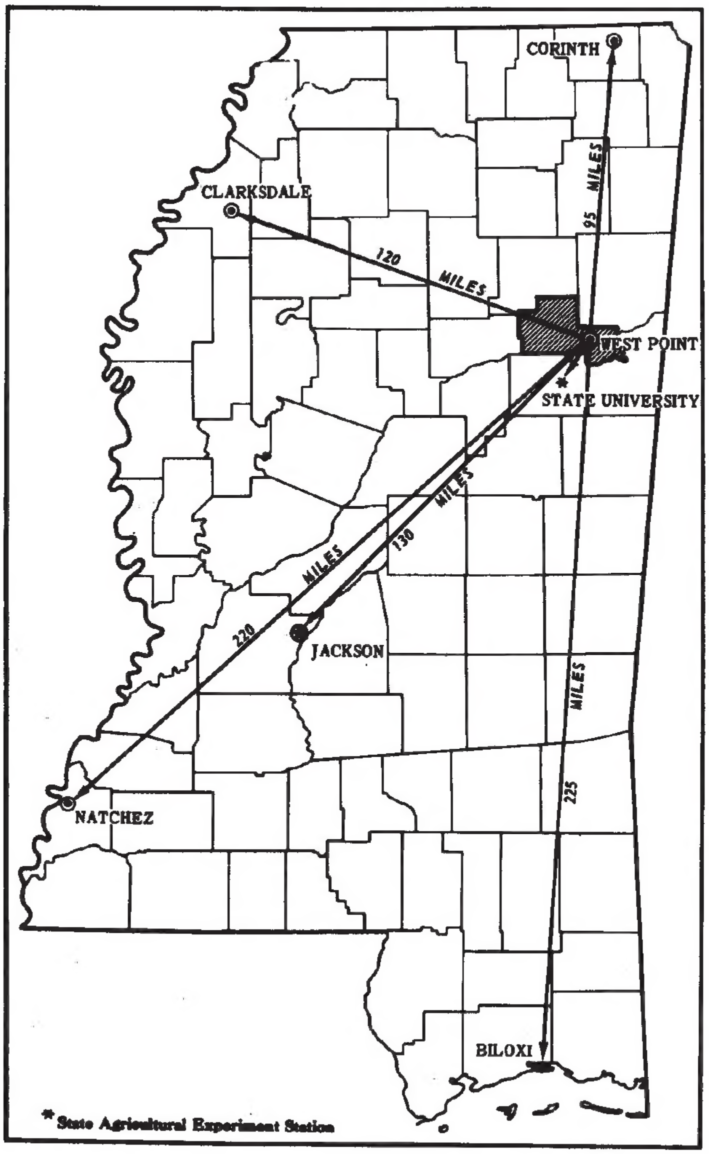

Figure 1.—Location of Clay County in Mississippi.

This county is mainly agricultural. Dairying and raising of beef cattle are important enterprises. The chief crops are soybeans, cotton, corn, and hay. Forest products are also important as a source of income.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Clay County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures (*12*).[1] The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Brooksville and Prentiss, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Brooksville silty clay, 1 to 3 percent slopes, is one of several phases within the Brooksville series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and

[1] Italic numbers in parentheses refer to Literature Cited, p. 62.

other details that help in drawing boundaries accurately. The soil map at the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Clay County: soil complexes and soil associations.

A soil complex consists of areas of two or more soils, so intricately mixed or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Chalk outcrop-Demopolis complex, 5 to 15 percent slopes, is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The name of an association consists of the names of the dominant soils, joined by a hyphen. Sweatman-Smithdale association, hilly, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, so severely eroded, or so variable that it has not been classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Chalk outcrop is a land type in Clay County.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kind of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kind of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants, and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to the slow permeability of the soil or to its high water table. They see that streets, road pavements, and foundations for houses are cracked on a particular soil, and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The General Soil Map at the back of this survey shows, in color, the soil associations in the survey area. A soil association is a landscape that has a distinctive pattern of soils in defined proportions. It typically consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in an association can occur in other associations, but in different patterns.

A map showing soil associations is useful to people who want to have a general idea of the soils in a survey area, who want to compare different parts of that area, or who want to locate large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide for broad planning on a watershed, a wooded tract, or a wildlife area or for broad planning of recreational facilities, community developments, and such engineering words as transportation corridors. It is not a suitable map for detailed planning for management of a farm or field or for selecting the exact location of a road or building or other structure, because the soils within an association ordinarily vary in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in this survey area have been grouped into general kinds of landscapes for broad interpretative purposes. Each of the broad groups and the soil associations in it are described on the following pages.

Areas on Flood Plains Dominated by Nearly Level Soils

Three associations in the county are made up of nearly level soils that are subject to flooding. These soils are on wide flood plains of the larger streams throughout the county.

1. Leeper-Griffith association

Somewhat poorly drained and moderately well drained, nonacid soils that are dominantly clayey below the surface layer

This association is on flood plains along Houlka and Chuquatonchee Creeks in the central part of the county.

This association makes up about 20 percent of the county. It is about 56 percent Leeper soils, 26 percent Griffith soils, and 18 percent minor soils.

The nearly level Leeper soils are on broad stream flood plains. They are somewhat poorly drained. In a representative profile the surface layer is dark grayish-brown silty clay loam about 7 inches thick. The upper 19 inches of the subsoil is dark grayish-brown silty clay and clay. The middle 22 inches is dark grayish-brown clay mottled with dark yellowish brown, and the lower 12 inches is olive-gray clay mottled with dark brown.

The Griffith soils are on the higher elevations along the streams. They are moderately well drained. In a representative profile the surface layer is dark olive-gray silty clay about 10 inches thick over very dark gray silty clay about 23 inches thick. Below this is dark-gray silty clay about 15 inches thick. The next layer is olive-gray silty clay that extends to a depth of 66 inches.

Most of the land has been cleared and is in row crops. The main crops are soybeans, cotton, and corn, which are well suited. The farms in this association average more than 300 acres in size. Damage to crops by flooding is a potential hazard. Drainage ditches are needed in low areas. The low, more poorly drained soils are used for pasture.

2. *Mathiston-Urbo-Una association*

Somewhat poorly drained and poorly drained, acid soils that have a dominantly loamy and clayey subsoil

This association is on flood plains along Johnson, Cane, and Line Creeks in the western part of the county.

This association makes up about 10 percent of the county. It is about 39 percent Mathiston soils, 30 percent Urbo soils, 14 percent Una soils, and 17 percent minor soils.

The nearly level Mathiston and Urbo soils are at slightly higher elevations than Una soils. They are somewhat poorly drained. In a representative profile of Mathiston soils, the surface layer is dark-brown silt loam about 6 inches thick. The subsoil to a depth of 13 inches is dark-brown silt loam mottled with grayish brown. To a depth of 50 inches, it is grayish-brown silt loam and silty clay loam mottled with yellowish brown.

In a representative profile of Urbo soils, the surface layer is dark grayish-brown silty clay loam about 6 inches thick. The upper 11 inches of the subsoil is grayish-brown silty clay mottled with dark brown. The next 16 inches is grayish-brown silty clay mottled with yellowish red. Below this, and extending to a depth of 60 inches or more, is grayish-brown silty clay mottled with olive brown.

The nearly level Una soils are on broad stream flood plains at slightly lower elevations than the other major soils in the association. They are poorly drained. In a representative profile the surface layer is dark grayish-brown clay loam about 5 inches thick. The subsoil is light-gray clay mottled with light yellowish brown, yellowish brown, or yellowish red. It extends to a depth of 52 inches or more.

Most of the land has been cleared and is in row crops. The main crops are cotton, soybeans, and corn, which are well suited. Damage to crops by flooding is a potential hazard. Drainage ditches are needed in low areas. Low, more poorly drained soils are used for pasture.

3. *Belden-Bigbee association*

Somewhat poorly drained and excessively drained, acid soils that have a dominantly loamy or sandy subsoil

This association is on flood plains along Town Creek and Tombigbee River in the eastern part of the county.

This association makes up about 5 percent of the county. It is about 65 percent Belden soils, 15 percent Bigbee soils, and 20 percent minor soils.

The nearly level Belden soils are on stream flood plains. They are somewhat poorly drained. In a representative profile the surface layer is dark grayish-brown silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches. It is grayish-brown silt loam in the upper part and light brownish-gray silty clay loam mottled with dark brown, yellowish brown, and olive brown in the lower part.

The nearly level Bigbee soils are on broad stream terraces at slightly higher elevations than Belden soils. They are excessively drained. In a representative profile the surface layer is dark yellowish-brown loamy sand about 8 inches thick. It is underlain by yellowish-red loamy sand about 9 inches thick. The next layer extends to a depth of 80 inches and is sand throughout. The upper part is yellowish brown and the lower part is pale brown.

Most of this association is in woodland. Cotton, corn, and soybeans are suited when the soils are adequately drained. Damage to crops by flooding is a potential hazard.

Areas on Uplands Dominated by Soils Over Chalk

Two soil associations in the county are made up of nearly level to strongly sloping, unstable soils over chalk. These soils formed mainly in clays underlain by chalk or marl. In some areas the thin soils have eroded away and the chalk crops out.

4. *Kipling-Okolona-Brooksville association*

Somewhat poorly drained and well-drained soils that are dominantly clayey below the surface layer

This association is on broad flats and short side slopes. There is a well-established pattern of creeks and drainageways that have fairly wide flood plains.

This association makes up about 20 percent of the county. It is about 60 percent Kipling soils, 18 percent Okolona soils, 8 percent Brooksville soils, and 14 percent minor soils.

The nearly level to sloping Kipling soils are on broad ridgetops and short side slopes. They are somewhat poorly drained. In a representative profile the surface layer is very dark grayish-brown silt loam about 4 inches thick. The subsoil extends to a depth of 50 inches. It is yellowish-brown silty clay mottled with pale brown in the upper part and mottled brown, gray, and red in the lower part. The underlying material between depths of 50 and 68 inches is clay or silty clay that is mottled in shades of gray, brown, and yellow.

The nearly level and gently sloping Okolona soils are on broad ridgetops. They are well drained. In a representative profile the surface layer is dark olive-gray and olive-gray silty clay about 33 inches thick. Below this is 5 inches of light olive-brown silty clay mottled with dark grayish brown. It is underlain by mottled light olive-brown and dark grayish-brown silty clay that extends to a depth of 65 inches.

The nearly level Brooksville soils are on broad, flat ridgetops. They are somewhat poorly drained. In a representative profile the surface layer is very dark grayish-brown and very dark brown silty clay about 31 inches thick. Reddish-brown mottles are in the lower part. The next layer is 17 inches thick. The upper part is olive-gray silty clay that has pale-olive mottles, and the lower part is olive silty clay that has olive-gray mottles. Below a depth of 48 inches is olive-gray and mottled light olive-gray and olive-yellow clay.

Most of this association is made up of large farms that average 500 acres or more in size. Most of the land has been cleared and is used for row crops. The main crops are soy-

beans, cotton, corn, and small grain. Much of the sloping Kipling soil is used for pasture.

5. *Binnsville-Chalk outcrop-Demopolis association*

Well-drained clayey soils that are shallow over chalk, and areas of Chalk outcrop

This association is on ridgetops and short side slopes. There is a well-established drainage pattern that has numerous small drainageways.

This association makes up about 2 percent of the county. It is about 55 percent Binnsville soils, 40 percent Chalk outcrop and Demopolis soils, and 5 percent minor soils.

The gently sloping Binnsville soils are on ridgetops. They are shallow soils that range from 6 to 20 inches thick over chalk. In a representative profile the surface layer is very dark gray silty clay loam about 4 inches thick. The next layer is very dark grayish-brown silty clay loam about 4 inches thick. The next 4 inches is light olive-gray silty clay loam. Below this is light-gray chalk.

Chalk outcrop is exposed chalk with Demopolis and Binnsville soils between gullies. The soil has been removed by erosion, and no profile remains.

The gently sloping Demopolis soils are on ridgetops and rolling side slopes. They are shallow soils that range from 5 to 16 inches thick over chalk. In a representative profile the surface layer is dark grayish-brown silty clay loam about 5 inches thick. The underlying material to a depth of about 9 inches is light olive-gray silty clay loam mottled with pale yellow. Below this is light-gray chalk to a depth of 24 inches.

Most of this land is used for unimproved pasture, low grade woodland, and recreation.

Areas on Uplands Dominated by Deep Soils

Three soil associations in the county are made up of deep, gently sloping to steep soils on uplands. These soils formed in acid loamy and clayey deposits.

6. *Smithdale-Ruston association*

Well-drained soils that have a dominantly loamy subsoil

This association is on ridgetops and hilly side slopes in the northwestern and northeastern parts of the county. Most slopes are more than 17 percent. The side slopes are between the ridgetops and narrow stream flood plains.

This association makes up about 5 percent of the county. It is about 48 percent Smithdale soils, 32 percent Ruston soils, and 20 percent minor soils.

The Smithdale soils are on side slopes. In a representative profile the surface layer is dark grayish-brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish-brown sandy loam about 7 inches thick. The subsoil extends to a depth of 80 inches. It is red sandy clay loam in the upper part and red sandy loam in the lower part.

The gently sloping Ruston soils are on ridgetops. In a representative profile the surface layer is pale-brown fine sandy loam about 7 inches thick. The subsoil is yellowish-red loam in the upper 12 inches, yellowish-red loam mottled with pale brown in the next 19 inches, and dark-red sandy loam in the next lower 20 inches. Below this, it is dark-red sandy clay loam that extends to a depth of 80 inches.

Most of this land is in woodland. Some areas have been cleared and used for row crops. Most of these areas, however, have reverted to woodland. The ridgetops and narrow stream flood plains are suited to row crops. The side slopes are better suited to trees.

7. *Sweatman-Smithdale association*

Well-drained soils that have a dominantly clayey and loamy subsoil

This association is on narrow ridgetops and hilly side slopes in the eastern part of the county bordering the Tombigbee River.

This association makes up about 3 percent of the county. It is about 46 percent Sweatman soils, 30 percent Smithdale soils, and 24 percent minor soils.

Sweatman soils are on narrow ridgetops and side slopes. In a representative profile the surface layer is pale-brown fine sandy loam about 4 inches thick. The subsoil extends to a depth of 38 inches. The upper 20 inches is red silty clay loam and silty clay that is mottled with pale brown and dark red between depths of 11 and 24 inches. The lower part is mottled pale-brown and red silty clay. The underlying material is stratified layers of yellowish-brown and strong-brown fine sandy loam and gray weathered shale. It extends to a depth of 60 inches or more.

Smithdale soils are sloping on ridgetops and hilly on side slopes. In a representative profile the surface layer is dark grayish-brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish-brown sandy loam about 7 inches thick. The subsoil to a depth of 28 inches is red sandy clay loam. Below this, it is red sandy loam that extends to a depth of 80 inches.

A small area of this association has been cleared and used for row crops. This association is better suited to trees than to crops, but a few ridgetops and stream flood plains are suited to crops. Erosion is a hazard on ridgetops, and overflow is a hazard on stream flood plains.

8. *Wilcox-Mayhew-Ozan association*

Somewhat poorly drained and poorly drained soils that have a dominantly clayey subsoil

This association is on nearly level to rolling ridgetops in the western part of the county.

This association makes up about 8 percent of the county. It is about 45 percent Wilcox soils, 27 percent Mayhew soils, 22 percent Ozan soils, and 6 percent minor soils.

The gently sloping to rolling Wilcox soils are on narrow ridgetops and side slopes. In a representative profile the surface layer is dark grayish-brown silt loam about 4 inches thick. The subsoil is yellowish-red clay to a depth of about 14 inches. It is mottled with yellowish brown and light brownish gray in the lower 5 inches. Below this is clay mottled in shades of gray and brown about 31 inches thick. The underlying material is light-gray soft shale that extends to a depth of about 60 inches.

The nearly level Mayhew soils are on ridgetops. In a representative profile the surface layer is dark grayish-brown silt loam about 5 inches thick. The subsoil extends to a depth of 48 inches or more. The upper 31 inches is light brownish-gray clay and the lower part is pale-olive clay.

The nearly level Ozan soils are on narrow ridgetops. In a

representative profile the surface layer is brown sandy loam about 7 inches thick. The subsurface layer is gray sandy loam mottled in shades of brown about 12 inches thick. The subsoil is loam and sandy clay loam and extends to a depth of 80 inches. The upper 18 inches is light brownish gray and the lower 43 inches is gray mottled in shades of brown.

Some of the land has been cleared and is used for row crops. The main crops are soybeans and cotton. This association is better suited to trees than to crops, but a few ridgetops and stream flood plains are suited to crops. Erosion is a hazard on ridgetops, and overflow is a hazard on the stream flood plains.

Areas on Uplands Dominated by Soils That Have a Fragipan

One soil association in the county is made up of nearly level to strongly sloping soils, most of which have fragipans. These soils formed in acid loamy deposits.

9. Ora-Prentiss-Longview association

Moderately well drained and somewhat poorly drained soils that have a dominantly loamy subsoil

This association is on ridgetops and side slopes in the north-central and southeastern parts of the county.

This association makes up about 27 percent of the county. It is about 35 percent Ora soils, 35 percent Prentiss soils, 15 percent Longview soils, and 15 percent minor soils.

Ora soils are gently to strongly sloping. In a representative profile the surface layer is dark yellowish-brown loam about 6 inches thick. The subsoil extends to a depth of 56 inches or more. The upper 4 inches is yellowish-brown loam, the next 16 inches is yellowish-red loam, the next 9 inches is a brittle, compact layer of dark yellowish-brown loam that is mottled pale brown, and the lower part is a brittle, compact layer of sandy loam mottled in shades of brown.

Prentiss soils are nearly level to gently sloping. In a representative profile the surface layer is dark grayish-brown sandy loam about 4 inches thick. The subsurface layer is light yellowish-brown sandy loam about 6 inches thick. The subsoil to a depth of about 26 inches is yellowish-brown loam. Below this, it is a brittle, compact layer about 34 inches thick. This layer is yellowish-brown loam mottled with light brownish gray in the upper half and loam mottled in shades of brown, gray, and red in the lower half.

Longview soils are nearly level to gently sloping. In a representative profile the surface layer is dark grayish-brown silt loam about 4 inches thick. The subsurface layer is brown silt loam about 4 inches thick. The subsoil extends to a depth of 80 inches. The upper 13 inches is yellowish-brown silt loam mottled with light brownish gray, the next 30 inches is silt loam mottled in shades of brown and gray, and the lower 29 inches is silty clay loam mottled in shades of brown and gray.

Most of this land has been cleared and is in row crops. The main crops are cotton, soybeans, and corn. Farms in this association are small. Many farmers obtain a large part of their income from their farms.

Descriptions of the Soils

In this section the soils of Clay County are described in detail. The procedure is to describe first the soil series and then the mapping units, or kinds of soil, in that series. Thus, to get full information on any one mapping unit, it is necessary to read both the description of that unit and the description of the soil series to which the unit belongs.

Each soil series description contains a short narrative description of a profile considered representative of the series, and a much more detailed description of the same profile that scientists, engineers, and others can use in making technical interpretations. The colors described are for a moist soil, unless otherwise noted.

Preceding the name of each mapping unit is the symbol that identifies the mapping unit on the detailed soil map at the back of this survey. Listed at the end of the description of each mapping unit are the capability unit and woodland group in which the mapping unit has been placed. The page on which each mapping unit is described can be found readily by referring to the "Guide to Mapping Units" at the back of this survey.

The approximate acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*12*).

Belden Series

The Belden series consists of somewhat poorly drained soils on flood plains. These soils formed in loamy alluvium high in silt. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark grayish-brown silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. The upper 10 inches is grayish-brown silt loam, and the lower 43 inches is light brownish-gray silty clay loam mottled with dark brown, yellowish brown, and olive brown.

Representative profile of Belden silt loam, in an area used for crops, three-fourths mile east of Montpelier school, 100 feet north of local road, SE¼SW¼ sec. 36, T. 16 S., R. 4 E.

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; common fine roots; slightly acid; clear, smooth boundary.

B21g—7 to 17 inches, grayish-brown (10YR 5/2) silt loam; common medium, distinct, dark-brown (10YR 4/3) mottles; weak, fine and medium, subangular blocky structure; friable, slightly sticky and slightly plastic; few fine roots; slightly acid; clear, wavy boundary.

B22g—17 to 30 inches, light brownish-gray (10YR 6/2) silty clay loam; common medium, distinct, dark-brown (10YR 4/3) and yellowish-brown (10YR 5/8) mottles; moderate, medium, subangular blocky structure; friable, sticky and plastic; few fine roots; common fine, black concretions; slightly acid; gradual, smooth boundary.

B23g—30 to 60 inches, light brownish-gray (10YR 6/2) silty clay loam; common medium, distinct, olive-brown (2.5Y 4/4) mottles; moderate, medium, subangular blocky structure; friable, sticky and plastic; many fine black concretions; slightly acid.

There are few to many black and brown concretions throughout the lower part of the profile. Reaction in the soil is medium acid to neutral except in areas where the surface has been limed.

The Ap horizon is dark grayish brown or grayish brown.

The B21 horizon is dark grayish brown or grayish brown mottled

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soil	Acres	Percent
Belden silt loam	14,230	5.4
Bigbee loamy sand	2,260	.8
Binnsville silty clay loam, 2 to 6 percent slopes	3,835	1.5
Brooksville silty clay, 0 to 1 percent slopes	1,230	.5
Brooksville silty clay, 1 to 3 percent slopes	3,245	1.2
Cahaba sandy loam, 0 to 2 percent slopes	1,160	.4
Chalk outcrop-Demopolis complex, 5 to 15 percent slopes	2,585	1.0
Griffith silty clay	14,120	5.3
Kipling silt loam, 0 to 2 percent slopes	5,110	1.9
Kipling silt loam, 2 to 5 percent slopes, eroded	16,795	6.3
Kipling silt loam, 5 to 8 percent slopes, eroded	10,900	4.1
Leeper silty clay loam	26,225	9.9
Longview silt loam, 0 to 2 percent slopes	6,395	2.4
Longview silt loam, 2 to 5 percent slopes	6,230	2.4
Mathiston silt loam	10,415	3.9
Mayhew silt loam, 0 to 2 percent slopes	5,815	2.2
Okolona silty clay, 0 to 1 percent slopes	2,445	.9
Okolona silty clay, 1 to 3 percent slopes	7,130	2.7
Ora loam, 2 to 5 percent slopes	9,720	3.7
Ora loam, 5 to 8 percent slopes, eroded	11,360	4.3
Ora loam, 8 to 12 percent slopes, eroded	6,040	2.3
Ozan sandy loam	4,670	1.8
Prentiss sandy loam, 0 to 2 percent slopes	3,300	1.2
Prentiss sandy loam, 2 to 5 percent slopes	22,805	8.6
Ruston fine sandy loam, 5 to 8 percent slopes	1,445	.6
Sessum silty clay	2,655	1.0
Smithdale-Ruston association, hilly	13,300	5.0
Stough sandy loam, 0 to 2 percent slopes	4,245	1.6
Sumter silty clay, 2 to 5 percent slopes, eroded	2,095	.8
Sumter silty clay, 5 to 12 percent slopes, eroded	2,905	1.1
Sweatman fine sandy loam, 5 to 12 percent slopes	1,665	.6
Sweatman-Smithdale association, hilly	3,765	1.4
Tippah silt loam, 2 to 5 percent slopes	225	.1
Tuscumbia-Leeper association, frequently flooded	10,075	3.8
Una clay loam	3,910	1.5
Urbo silty clay loam	7,955	3.0
Wilcox silt loam, 2 to 5 percent slopes	2,515	.9
Wilcox silt loam, 5 to 8 percent slopes	2,820	1.1
Wilcox silt loam, 8 to 17 percent slopes	4,365	1.7
Water	3,000	1.1
Total	264,960	100.0

with yellowish brown, dark brown, or light brownish gray. The B22 horizon is dark grayish brown, grayish brown, or light brownish gray. It has few to many mottles in shades of brown. The B23 horizon has colors similar to the B22 horizon or is mottled in shades of brown and gray. The B horizon is silt loam, silty clay loam, or clay loam. It ranges from 40 to 60 percent silt and 25 to 35 percent clay.

Belden soils are near Leeper, Mathiston, Una, and Urbo soils. They are less clayey in the B horizon than Leeper soils, less acid in the B horizon than Mathiston soils, and less clayey and less acid in the B horizon than Una and Urbo soils.

Be—Belden silt loam. This somewhat poorly drained soil is on flood plains. Slopes are 0 to 2 percent. Included in mapping are small areas of Leeper and Urbo soils.

Reaction is medium acid to neutral. Available water capacity is high. Water moves through the soil at a moderate rate. Runoff is slow, and the hazard of erosion is slight in cultivated areas. Flooding commonly occurs in winter, early in spring, and occasionally during the growing season, but it seldom damages crops.

Row crops can be grown year after year if good conservation practices are used. Graded rows and surface field ditches are needed to remove excess surface water.

If this soil is adequately drained and fertilized, it is well suited to cotton, corn, soybeans, and pasture. Most of the acreage is cultivated or used for pasture, but a few areas are in pine trees or hardwoods. Capability unit IIw-6; woodland group 1w8.

Bigbee Series

The Bigbee series consists of excessively drained soils on stream terraces. These soils formed in sandy material. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark yellowish-brown loamy sand about 8 inches thick. The underlying material is yellowish-red loamy sand to a depth of 17 inches, yellowish-brown sand to a depth of 32 inches, and pale-brown sand to a depth of 80 inches or more.

Representative profile of Bigbee loamy sand, in an area used for pasture, 7 miles east of intersection of U.S. Highway 45 West, one-fourth mile west of Tombigbee River on Mississippi Highway 50, 1½ miles east on gravel road, and 2 miles northeast on gravel road, SE¼NW¼ sec. 8, T. 17 S., R. 8 E.

Ap—0 to 8 inches, dark yellowish-brown (10YR 3/4) loamy sand; single grained; loose; few fine roots; strongly acid; clear, smooth boundary.

C1—8 to 17 inches, yellowish-red (5YR 4/8) loamy sand; single grained; very friable; few fine roots; strongly acid; abrupt, smooth boundary.

C2—17 to 32 inches, yellowish-brown (10YR 5/4) sand; single grained; loose; strongly acid; clear, smooth boundary.

C3—32 to 80 inches, pale-brown (10YR 6/3) sand; single grained; loose; strongly acid.

Reaction in the soil is medium acid through very strongly acid. In some places the soil is underlain by gravel 6 to 16 feet below the surface.

The A horizon is dark brown, dark yellowish brown, dark grayish brown, or very dark grayish brown.

The C horizon is yellowish-red, yellowish-brown, or pale-brown fine sand or sand. The content of silt and clay between depths of 10 and 40 inches ranges from 5 to 10 percent.

Bigbee soils are near Cahaba soils. They do not have the Bt horizon that is characteristic of Cahaba soils, and they do not have a loamy subsoil.

Bg—Bigbee loamy sand. This excessively drained soil is on terraces of larger streams. Slopes are 0 to 2 percent. Included in mapping are small areas of Cahaba soils.

Reaction is medium acid to very strongly acid. Available water capacity is low. Water moves through the soil rapidly. Runoff is slow, and the hazard of erosion is slight in cultivated areas. This soil is easy to till, and it can be cultivated over a wide range of moisture content. Flooding commonly occurs in winter and early in spring for a brief duration, but it seldom damages crops.

Most of the acreage is wooded. A small area is used for crops or pasture. This soil is suited to corn, truck crops, pasture plants such as bahiagrass and bermudagrass, and pine trees.

Proper fertilization and the return of crop residue are needed if row crops are grown year after year. Capability unit IIIs-1; woodland group 2s2.

Binnsville Series

The Binnsville series consists of shallow, well-drained soils on uplands. These soils formed in clayey material over chalk. Slopes are 2 to 6 percent.

In a representative profile the surface layer is very dark gray silty clay loam in the upper 4 inches and very dark

grayish-brown silty clay loam in the lower 4 inches. The underlying material to a depth of 12 inches is light olive-gray silty clay loam. Below this is light-gray chalk.

Representative profile of Binnsville silty clay loam, 2 to 6 percent slopes, in an area of idle land 3½ miles southeast of McCondy community, about one-fourth mile northeast of State Line Plant, NW¼NE¼ sec. 25, T. 15 S., R. 4 E.

Ap—0 to 4 inches, very dark gray (10YR 3/1) silty clay loam; weak, fine, granular structure; friable, slightly sticky; many fine roots; calcareous, moderately alkaline; abrupt, smooth boundary.

A1—4 to 8 inches, very dark grayish-brown (2.5Y 3/2) silty clay loam; moderate, fine, subangular blocky and granular structure; firm, sticky and plastic; common fine roots; few fine, light-gray soft fragments of chalk in lower part; many worm casts; calcareous, moderately alkaline; clear, wavy boundary.

C1—8 to 12 inches, light olive-gray (5Y 6/2) silty clay loam; moderate, fine, subangular blocky structure; firm, sticky and plastic; few fine roots; many worm casts; few fine, distinct streaks of pale yellow; about 20 percent light-gray (5Y 7/1) platy fragments of chalk; calcareous, moderately alkaline; clear, wavy boundary.

C2—12 to 48 inches, light-gray (5Y 7/2) chalk; few fine splotches and streaks of yellowish brown; horizontal, platy rock structure; can be dug with spade when moist; calcareous, moderately alkaline.

Clay content from the surface to the top of the C2 horizon ranges between 35 and 50 percent. Thickness of the soil over chalk ranges from 6 to 20 inches.

The Ap and A1 horizons are very dark gray or very dark grayish brown.

The C horizon is dark gray, light olive gray, light gray, olive gray, or olive. The A and C horizons are silty clay loam or silty clay.

Binnsville soils are near Brooksville, Kipling, Okolona, and Sumter soils. Binnsville soils are thinner than Brooksville, Okolona, and Sumter soils. They are more alkaline and are thinner than Kipling soils. They are better drained than Brooksville and Kipling soils.

BnB—Binnsville silty clay loam, 2 to 6 percent slopes. This well-drained, shallow soil is on broad upland flats. Included in mapping are small areas of Sumter soils and areas of severely eroded soils.

Reaction is moderately alkaline. Available water capacity is low. Water moves through the soil slowly. Runoff is rapid, and the hazard of further erosion is moderate. Because of shallow depth to chalk, the soils need a permanent vegetative cover to protect them from erosion.

Most of the acreage is used for pasture. The rest is idle. This soil is well suited to King Ranch bluestem and common bermudagrass. Capability unit VIe-1; woodland group 4d3c.

Brooksville Series

The Brooksville series consists of somewhat poorly drained soils on uplands. These soils formed in clayey material. Slopes are 0 to 3 percent.

In a representative profile the surface layer is silty clay about 31 inches thick. It is very dark grayish brown in the upper 6 inches, very dark brown in the next 6 inches, and very dark grayish brown with reddish-brown mottles in the lower 19 inches. The next layer is 17 inches thick. The upper part is olive-gray silty clay that has pale-olive mottles, and the lower part is olive silty clay that has olive-gray mottles. Below a depth of 48 inches is olive-gray and mottled light olive-gray and olive-yellow clay.

Representative profile of Brooksville silty clay, 1 to 3 percent slopes, in an area used for crops, 3 miles north of West Point, 100 feet east of GM&O Railroad, NW¼SW¼ sec. 23, T. 16 S., R. 6 E.

Ap—0 to 6 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, medium, granular structure; friable, plastic; many fine roots; few fine brown concretions; neutral; abrupt, smooth boundary.

A11—6 to 12 inches, very dark brown (10YR 2/2) silty clay; moderate, medium, subangular blocky structure; firm, very sticky and very plastic; few fine roots; few fine brown and black concretions; medium acid; clear, wavy boundary.

A12—12 to 31 inches, very dark grayish-brown (10YR 3/2) silty clay; common medium, distinct, reddish-brown (5YR 4/4) mottles; moderate, fine and medium, angular blocky structure; firm, very sticky and very plastic; few fine roots; few fine brown and black concretions; slightly acid; clear, wavy boundary.

AC1—31 to 40 inches, olive-gray (5Y 4/2) silty clay; common medium, distinct, pale-olive (5Y 6/3) mottles; intersecting slickensides 4 to 5 inches across form wedge-shaped aggregates which part to moderate, fine and medium, angular blocky structure; firm, very sticky and very plastic; few fine roots; few fine brown concretions; mildly alkaline; clear, wavy boundary.

AC2—40 to 48 inches, olive (5Y 5/3) silty clay; few to common fine and medium, olive-gray (5Y 4/2) mottles; intersecting slickensides 4 to 5 inches across form wedge-shaped aggregates which part to moderate, fine and medium, angular blocky structure; firm, very sticky and very plastic; few fine roots; few fine brown and black concretions; mildly alkaline; gradual, wavy boundary.

C1—48 to 56 inches, olive-gray (5Y 5/2) clay; common medium, distinct, olive-yellow (5Y 6/6) mottles; intersecting slickensides form wedge-shaped aggregates which part to moderate, medium, subangular blocky structure; very firm, very sticky and very plastic; few fine roots; few fine brown and black concretions; few coarse lime nodules; calcareous, moderately alkaline; gradual, wavy boundary.

C2—56 to 70 inches, mottled light olive-gray (5Y 6/2) and olive-yellow (5Y 6/8) clay; intersecting slickensides form wedge-shaped aggregates which part to moderate, medium, angular and subangular blocky structure; very firm, very sticky and very plastic; many fine and medium black concretions; few coarse lime nodules; calcareous, moderately alkaline.

There are few to many brown and black concretions throughout the soil. Cycles of microbasins and microknolls are repeated about every 7 to 20 feet. Very dark brown or very dark grayish-brown horizons are 16 to 25 inches thick in the centers of the microbasins and 6 to 14 inches thick in the centers of the microknolls. The soils are wet at some time during the year.

The Ap horizon is very dark gray or very dark grayish brown. The A1 horizon is very dark gray, very dark brown, or very dark grayish brown. Reaction is slightly acid to strongly acid unless limed. Clay content between depths of 10 and 40 inches ranges from 35 to 55 percent. Within a depth of 20 inches are few to many distinct or prominent mottles of red or reddish brown.

The AC horizon is olive, olive-gray, or dark grayish-brown silty clay or clay. The extremes of amplitude (waviness) of the boundary between the A and AC horizons vary from 8 inches at the centers of the microknolls to 38 inches at the centers of the microbasins. Reaction in the AC and C horizons is neutral through moderately alkaline.

The C horizon is silty clay or clay. It is olive gray and light olive brown or is mottled in shades of brown, yellow, or gray.

Brooksville soils are near Binnsville, Kipling, Okolona, and Sessum soils. Brooksville soils are thicker than Binnsville soils. They lack B horizons and are darker than Kipling soils. Brooksville soils resemble Okolona soils in color, but have red or brown mottles in the upper 20 inches. They are better drained and not so gray as Sessum soils.

BrA—Brooksville silty clay, 0 to 1 percent slopes. This somewhat poorly drained soil is on broad, flat ridgetops. Included in mapping are small areas of Binnsville, Kipling, and Okolona soils.

In a representative profile the surface layer is very dark grayish-brown silty clay in the upper 7 inches and very dark grayish-brown silty clay mottled with reddish brown in the lower 16 inches. The next layer, about 10 inches

thick, is dark grayish-brown silty clay with yellowish-red mottles. Below this, and extending to a depth of 60 inches or more, is mottled yellowish-brown and light brownish-gray clay.

Reaction is medium acid in the upper part of this soil and neutral in the lower part. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow, and the hazard of erosion is slight. Tilth is not easily maintained. This soil shrinks and forms cracks as it dries and swells as it becomes wet. It can be worked within only a narrow range of moisture content without clodding and crusting. Shredding crop residue and leaving it on the surface helps improve tilth.

This soil can be rowcropped year after year if adequate conservation practices are used. Graded rows and surface field ditches are needed to remove excess surface water.

If this soil is adequately fertilized, it is suited to cotton, corn, oats, soybeans, and pasture. Most areas are used for row crops or pasture. Capability unit IIw-4; woodland group 4c2c.

BrB—Brooksville silty clay, 1 to 3 percent slopes. This somewhat poorly drained soil is on ridgetops. It has the profile described as representative for the series. Included in mapping are small areas of Kipling and Okolona soils.

Reaction is medium acid or neutral in the upper part of this soil and neutral to moderately alkaline in the lower part. Available water capacity is high. Water moves through the soil very slowly. Runoff is medium, and the hazard of erosion is moderate. Tilth is not easily maintained. This soil shrinks and cracks as it dries and swells as it becomes wet. It can be worked within only a narrow range of moisture content without clodding and crusting.

Where this soil is cultivated, crops that produce a large amount of residue should be grown to help to reduce crusting, packing, and erosion.

This soil is suited to cotton, corn, oats, soybeans, and pasture if it is properly fertilized. Most areas are used for row crops and pasture. Capability unit IIe-1; woodland group 4c2c.

Cahaba Series

The Cahaba series consists of well-drained soils on stream terraces. These soils formed in loamy materials. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark-brown sandy loam about 17 inches thick. The subsoil is yellowish-red sandy clay loam and loam that extends to a depth of 42 inches. It is underlain by yellowish-brown loamy sand that extends to a depth of 80 inches or more.

Representative profile of Cahaba sandy loam, 0 to 2 percent slopes, in an area used for crops, 7 miles east of West Point, one-fourth mile west of Tombigbee River, SE¼NE¼ sec. 19, T. 17 S., R. 8 E.

Ap—0 to 9 inches, dark-brown (10YR 4/3) sandy loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

A1—9 to 17 inches, dark-brown (7.5YR 4/4) sandy loam; weak, fine, granular structure; very friable; few fine roots; strongly acid; gradual, wavy boundary.

B21t—17 to 34 inches, yellowish-red (5YR 4/8) sandy clay loam; weak, fine, subangular blocky structure; friable; few fine roots; coating and bridging of sand grains with clay; strongly acid; gradual, wavy boundary.

B22t—34 to 42 inches, yellowish-red (5YR 4/6) loam; weak, fine and medium, subangular blocky structure; friable; coating and bridging of sand grains with clay; strongly acid; gradual, wavy boundary.

C—42 to 80 inches, yellowish-brown (10YR 5/4) loamy sand; common medium, faint, dark yellowish-brown (10YR 4/4) mottles; structureless; single grained; friable; strongly acid; gradual, wavy boundary.

The Ap horizon is brown, dark brown, or dark grayish brown. The A1 horizon is dark brown or brown.

The B2t horizon is dominantly yellowish red but ranges to reddish brown. It is loam, sandy clay loam, or clay loam. Clay content of the upper 20 inches of the B2t horizon averages from 18 to 35 percent.

The C horizon is yellowish-brown, dark-brown, yellowish-red, or reddish-brown loamy sand or fine sandy loam. Reaction is medium acid to very strongly acid except where the surface has been limed.

Cahaba soils are near Bigbee soils. They are more clayey in the A and B horizons than Bigbee soils.

CaA—Cahaba sandy loam, 0 to 2 percent slopes. This well-drained soil is on terraces of larger streams. Included in mapping are small areas of Bigbee soils.

Reaction is medium acid to very strongly acid. Available water capacity is medium. Water moves through the subsoil at a moderate rate. Runoff is medium, and the hazard of erosion is slight. Tilth is easy to maintain. This soil can be worked throughout a wide range of moisture content.

This soil can be cropped year after year if good conservation practices are used. Most of the acreage is used for pasture or for truck crops. The soil is well suited to cotton, corn, oats, and pasture if it is adequately fertilized. The soil floods occasionally during periods of high rainfall. Capability unit I-1; woodland group 2o7.

Chalk Outcrop

Chalk outcrop is a miscellaneous land type on uplands. It consists of soils so severely damaged by erosion that reclamation for row crops and pasture is not economically practical. A large part of the surface layer and much of the subsoil have been lost through erosion. Many gullies where chalk is at the surface are not crossable with farm machinery. Slopes range from 5 to 15 percent.

CoD—Chalk outcrop-Demopolis complex, 5 to 15 percent slopes. This gently sloping to steep complex is in eroded areas that are broken by numerous chalk outcrops, gullies, and short drainageways. The areas of this complex are small, generally no larger than the surrounding areas that consist of only one soil.

This mapping unit is about 75 percent Chalk outcrop and about 25 percent Demopolis soils. The pattern and extent of the soils and Chalk outcrops are uniform. Each area contains both Chalk outcrop and Demopolis soils. Much of the area has a thin 1- to 2-inch mulch of chalk fragments and soil material.

Gullies range from 5 to 150 feet in width and from 2 to 10 feet in depth. Most of the chalk outcrops and gullied areas have eroded, and the soil profile is no longer discernible (fig. 2). These areas support a very sparse cover of cedar trees and scrub hardwoods. Some grass grows between the chalk outcrops and gullies. Some areas have been reclaimed by smoothing and seeding to grass. Runoff is very rapid, and erosion is active in the areas that are not protected.

Figure 2.—Area of Chalk outcrop-Demopolis complex, 5 to 15 percent slopes.

Demopolis soils occur as islands between areas of chalk outcrop. They have the profile described as representative for the series. The Demopolis soils are moderately alkaline and calcareous. Available water capacity is low. Water moves through the soil slowly. Runoff is rapid, and the hazard of erosion is high if these soils are left bare.

These soils should be kept in permanent vegetation because of rapid runoff and the severe hazard of erosion.

Many chalk outcrops and gullies are bare of any vegetation. The areas between the Chalk outcrops are covered with poor quality native grasses, cedar trees, and scrub hardwoods. Capability unit VIe-2; soils too variable to rate for woodland.

Demopolis Series

The Demopolis series consists of shallow, well-drained soils on uplands. These soils formed in clayey material over chalk. Slopes are 5 to 15 percent.

In a representative profile the surface layer is dark grayish-brown silty clay loam about 5 inches thick. The underlying material is light olive-gray silty clay loam mottled with pale yellow, and is about 4 inches thick. Below this is light-gray chalk that extends to a depth of 24 inches or more.

Representative profile of Demopolis silty clay loam, from an area of Chalk outcrop-Demopolis complex, 5 to 15 percent slopes, in an area used for pasture, 4 miles northwest of Abbott along gas transmission line, NW¼NE¼ sec. 31, T. 15 S., R. 5 E.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) silty clay loam; moderate, fine, granular structure; friable; slightly sticky; common fine roots; common fine lime fragments; calcareous, moderately alkaline; abrupt, smooth boundary.

C—5 to 9 inches, light olive-gray (5Y 6/2) silty clay loam; common medium, distinct, pale-yellow (5Y 7/4) mottles; weak, fine, subangular blocky structure; friable; few fine roots; about 50 percent platy chalk fragments; calcareous, moderately alkaline; clear, smooth boundary.

R—9 to 24 inches, light-gray (5Y 7/2) chalk; common coarse, distinct, pale-yellow (5Y 7/4) mottles; horizontal platy rock structure.

The Ap horizon is dark grayish brown or brown.

The C horizon is olive, light olive gray, olive brown, light gray, light brownish gray, pale yellow, or pale olive. It is silty clay loam to clay loam.

The R horizon is light gray, light olive gray, or light brownish gray. Depth to chalk ranges from 4 to 16 inches.

Demopolis soils are near Binnsville, Brooksville, Kipling, and Okolona soils. They are not so dark in the A horizon as Binnsville soils.

They are thinner than Brooksville and Okolona soils. They are less acid and thinner than Kipling soils.

Griffith Series

The Griffith series consists of moderately well drained soils on flood plains. These soils formed in clayey material. Slopes are 0 to 2 percent.

In a representative profile (fig. 3) the surface layer is dark olive-gray silty clay in the upper 10 inches and very dark gray silty clay to a depth of 33 inches. Below this is dark-gray silty clay to a depth of 48 inches and olive-gray silty clay to a depth of 66 inches or more.

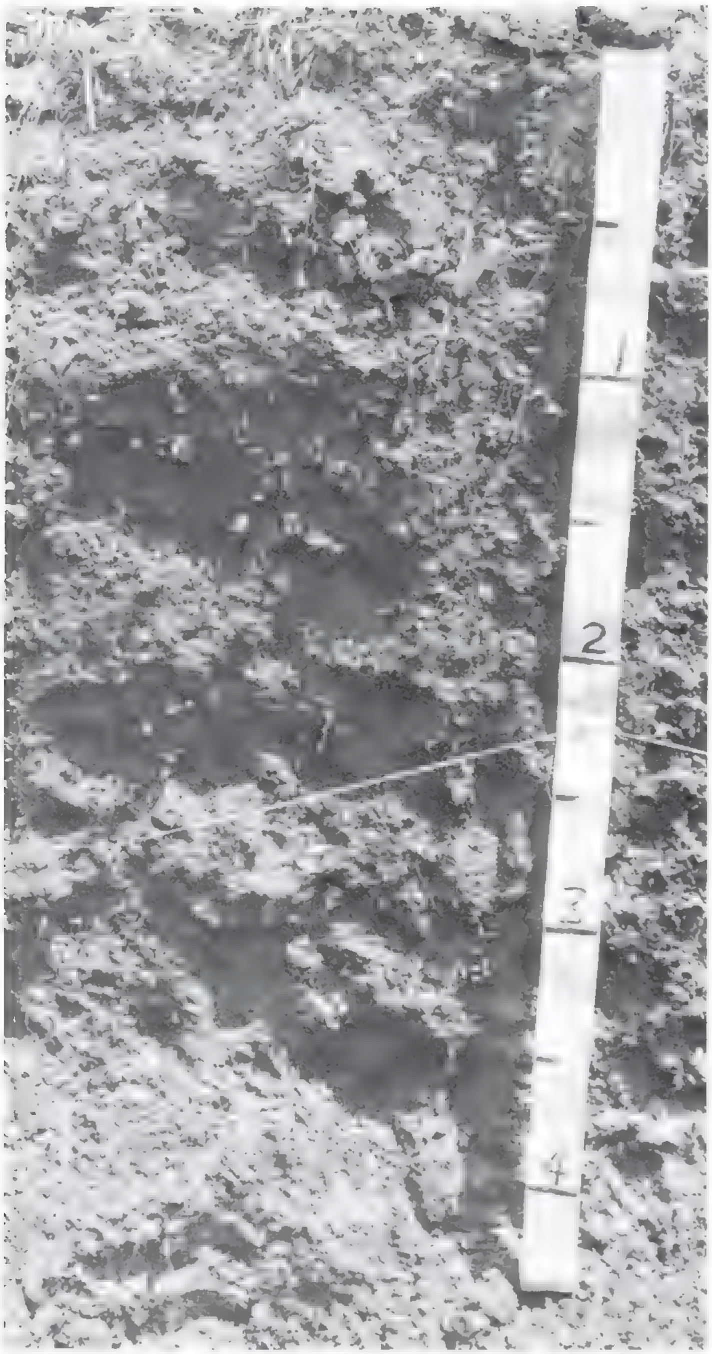

Figure 3.—**Profile of Griffith silty clay showing structure and root penetration. The string shows the variable depth of the AC horizon. Note root penetration below a depth of 4 feet.**

Representative profile of Griffith silty clay, in an area used for pasture, 3 miles east of West Point and one-half mile south of Mississippi Highway 50, NE¼NE¼ sec. 17, T. 17 S., R. 7 E.

Ap—0 to 10 inches, dark olive-gray (5Y 3/2) silty clay; moderate, fine and medium, granular and subangular blocky structure; firm, very plastic; common fine roots; common fine calcium carbonate nodules; calcareous, moderately alkaline; clear, wavy boundary.

A11—10 to 22 inches, very dark gray (5Y 3/1) silty clay; moderate, medium, prismatic structure parting to moderate, fine, granular and subangular blocky; firm, very plastic; common fine roots; common wormcasts; few fine calcium carbonate nodules; shiny faces on peds; noncalcareous, moderately alkaline; gradual, wavy boundary.

A12—22 to 33 inches, very dark gray (5Y 3/1) silty clay; moderate, medium, prismatic structure parting to moderate, fine, granular and fine, angular blocky; firm, very plastic; few fine roots; few fine calcium carbonate nodules; shiny faces on peds; noncalcareous, moderately alkaline; gradual, wavy boundary.

AC1—33 to 48 inches, dark-gray (5Y 4/1) silty clay ped exterior, olive-gray (5Y 4/2) ped interior; intersecting slickensides 3 to 4 inches across parting to fine, wedge-shaped fragments; very firm, very plastic; few fine roots; few medium calcium carbonate nodules; shiny faces on peds; noncalcareous, moderately alkaline; clear, wavy boundary.

AC2—48 to 66 inches, olive-gray (5Y 4/2) silty clay ped exterior, olive (5Y 4/3) ped interior; intersecting slickensides 3 to 4 inches across parting to fine, wedge-shaped fragments; very firm, very plastic; few fine roots; common coarse, calcium carbonate nodules; calcareous, moderately alkaline.

The Ap and A1 horizons are very dark gray, very dark grayish brown, black, very dark brown, or dark olive gray. Combined thickness of the A horizon ranges from 24 to 48 inches. The Ap horizon is noncalcareous in those areas that lack the thin overwash from calcareous soils such as Sumter soils. The AC horizon is dark-gray, dark grayish-brown, grayish-brown, olive-gray, or olive silty clay or clay. Clay content at depths between 10 and 40 inches ranges from 40 to 60 percent. Intersecting slickensides begin at depths between 26 and 28 inches. The AC horizon contains few to many calcium carbonate nodules, and in some areas it is calcareous.

The extremes of amplitude (waviness) of the boundary between the A and AC horizons vary from depths of about 6 to 10 inches. Reaction is neutral to moderately alkaline.

Griffith soils are near Leeper and Okolona soils. They have thicker and darker A horizons than Leeper soils. They are not so well drained as Okolona soils.

Gr—Griffith silty clay. This moderately well drained soil is on flood plains. Slopes are 0 to 2 percent. Included in mapping are small areas of Leeper and Okolona soils.

Reaction is moderately alkaline. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow, and the hazard of erosion is slight. Tilth is not easily maintained. This soil shrinks and forms cracks as it dries and swells as it becomes wet. It can be worked within only a narrow range of moisture content without clodding and crusting. Flooding commonly occurs in winter and early in spring, and occasionally during the growing season, but crops are seldom damaged.

This soil can be cropped year after year if suitable cropping systems are used.

If this soil is adequately drained (fig. 4) and fertilized, it is well suited to cotton, corn, oats, soybeans, pasture, and hardwood trees. Most of the acreage is used for crops. Capability unit IIw-5; woodland group 1w6.

Figure 4.—Drainage ditch that removes surface water from Griffith silty clay.

Kipling Series

The Kipling series consists of somewhat poorly drained soils on uplands. These soils formed in clayey material. Slopes are 0 to 8 percent.

In a representative profile the surface layer is very dark grayish-brown silt loam about 4 inches thick. The subsoil is silty clay that extends to a depth of 50 inches. The upper 4 inches is yellowish brown mottled with pale brown, and the lower part is mottled brown, gray, and red. The underlying material is clay, mottled in shades of gray, brown, and yellow, that extends to a depth of about 68 inches or more.

Representative profile of Kipling silt loam, 2 to 5 percent slopes, eroded, in an area used for crops, 4½ miles south of West Point, 600 yards east of U.S. Highway 45 on Tibbee road, NE¼SW¼ sec. 8, T. 19 N., R. 16 E.

Ap—0 to 4 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, granular structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21t—4 to 8 inches, yellowish-brown (10YR 5/8) silty clay, many medium, distinct, pale-brown (10YR 6/3) mottles; weak, fine and medium, subangular blocky structure; friable, slightly sticky and slightly plastic; many fine roots; very strongly acid; clear, smooth boundary.

B22t—8 to 14 inches, mottled red (2.5YR 4/8), pale-brown (10YR 6/3), and gray (10YR 6/1) silty clay; moderate, fine and medium, angular and subangular blocky structure; firm, sticky and plastic; common fine roots; very strongly acid; clear, smooth boundary.

B23t—14 to 22 inches, mottled gray (10YR 6/1), red (2.5YR 4/8), and strong-brown (7.5YR 5/8) silty clay; moderate, fine and medium, angular and subangular blocky structure; firm, sticky and plastic; few fine roots; very strongly acid; gradual, wavy boundary.

B24t—22 to 37 inches, mottled gray (5Y 6/1), strong-brown (7.5YR 5/8), and yellowish-red (5YR 4/8) silty clay; moderate, fine and medium, subangular blocky structure; firm, very sticky and very plastic; few fine roots; few slickensides; very strongly acid; clear, wavy boundary.

B25t—37 to 50 inches, mottled yellowish-brown (10YR 5/8) and gray (10YR 6/1) silty clay; moderate, fine and medium, angular and subangular blocky structure; firm, very sticky and very plastic; many slickensides; many fine brown and black concretions; very strongly acid; gradual, wavy boundary.

C1—50 to 58 inches, mottled brownish-yellow (10YR 6/6), yellowish-brown (10YR 5/8), and gray (10YR 6/1) clay; intersecting slickensides form wedge-shaped aggregates that part to moderate, fine and medium, angular blocky structure; firm, very sticky and very plastic; fine black and brown concretions and coatings; strongly acid; gradual, wavy boundary.

C2—58 to 68 inches, mottled brownish-yellow (10YR 6/6), yellowish-brown (10YR 5/8), and light brownish-gray (2.5Y 6/2) clay; intersecting slickensides form wedge-shaped aggregates that part to moderate, fine and medium, angular blocky structure; firm, very sticky and very plastic; many lime nodules; few fine black and brown concretions; neutral.

The Ap horizon is dark brown, brown, very dark grayish brown, dark grayish brown, or yellowish brown.

The B horizon is yellowish brown, light yellowish brown, brown, or red mottled with gray, red, or brown, or is mottled in shades of yel-

low, brown, red, or gray. It is silty clay loam, silty clay, or clay. Content of clay in the upper 20 inches of the B horizon ranges from 35 to 50 percent, and content of silt ranges from 35 to 60 percent. Reaction in the upper part of the soil is strongly acid to extremely acid, and reaction near the chalk is medium acid through moderately alkaline. The B3 horizon, if present, and the C horizon range from strongly acid through moderately alkaline. Slickensides intersect below a depth of 40 inches.

Kipling soils are near Binnsville, Brooksville, Sessum, and Sumter soils. They are thicker than Binnsville soils. They lack the thicker, dark-colored surface layer of Brooksville soils and are more acid in the upper part of the soil. They are not so gray as and are better drained than Sessum soils. They are more acid in the upper part of the soil than Sumter soils.

KpA—Kipling silt loam, 0 to 2 percent slopes. This somewhat poorly drained soil is on broad upland flats. Included in mapping are small areas of Binnsville, Brooksville, and Sessum soils.

This soil has a surface layer of dark grayish-brown silt loam about 4 inches thick. It is underlain to a depth of 16 inches by yellowish-brown silty clay or clay mottled with gray and red. The next layer, to a depth of 52 inches, is clay that is mottled in shades of brown, red, and yellow. Below this is chalk.

Reaction is strongly acid or very strongly acid in the upper part of the profile and medium acid through moderately alkaline near the chalk. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow, and the hazard of erosion is slight. Tilth is difficult to maintain. This soil shrinks and cracks as it dries and swells when wet. Proper use of crop residue improves tilth.

This soil can be rowcropped year after year if adequate conservation practices are used. Graded rows and surface field ditches are needed to remove excess surface water.

The soil is suited to cotton, corn, oats, soybeans, and pasture. It is also suited to pine trees and adapted hardwoods. Most areas are cleared and under cultivation. Capability unit IIw-4; woodland group 2c8.

KpB2—Kipling silt loam, 2 to 5 percent slopes, eroded. This somewhat poorly drained soil is on ridgetops. It has the profile described as representative of the series. Rills and shallow gullies have formed in most areas, and there are a few deep gullies. Where cultivated, the surface layer is a mixture of the original surface layer and the upper part of the subsoil. Included in mapping are small areas of Brooksville and Sumter soils.

Reaction is strongly acid or very strongly acid in the upper part of the profile and medium acid through moderately alkaline near the chalk. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow to medium, and the hazard of erosion is slight to moderate in cultivated areas. Tilth is difficult to maintain. The soil shrinks and cracks as it dries and swells when wet. Use of crop residue is beneficial.

If this soil is cropped, an adequate cropping system must be used to help control erosion. Good management includes using a suitable cropping system, cultivating on the contour, stripcropping, terracing, and keeping grass in waterways.

The soil is suited to cotton, corn, oats, soybeans, pasture, pine trees, and adapted hardwood trees. Most areas of this soil are cleared and cultivated. Capability unit IIIe-3; woodland group 2c8.

KpC2—Kipling silt loam, 5 to 8 percent slopes, eroded. This somewhat poorly drained soil is on ridgetops and upper side slopes. Most areas are marked by rills and shallow gullies and a few deep gullies. Included in mapping are small areas of Binnsville, Brooksville, and Sumter soils.

This soil has a surface layer of dark grayish-brown silt loam about 3 inches thick. The upper part of the subsoil is yellowish-brown silty clay loam that extends to a depth of about 7 inches. In the middle part the subsoil is strong-brown silty clay mottled with light brownish gray and yellowish red. In the lower part, the subsoil grades to clay and is mottled in shades of red, brown, and gray.

Reaction is strongly acid or very strongly acid in the upper part of the profile and medium acid through moderately alkaline near the chalk. Available water capacity is high. Water moves through the soil very slowly. Runoff is medium, and the hazard of erosion is severe in cultivated areas. Tilth is difficult to maintain. Use of crop residue is beneficial. This soil shrinks and cracks as it dries.

This soil can be used for row crops if cultivation on the contour, stripcropping, terracing, and grassing of waterways are practiced.

If adequate amounts of fertilizer are applied, the soil is suited to cotton, corn, oats, soybeans, and pasture. It is also suited to pine trees and adapted hardwood trees. Most areas of this soil are cleared and are cultivated. Capability unit IVe-1; woodland group 2c8.

Leeper Series

The Leeper series consists of somewhat poorly drained soils on flood plains. These soils formed in clayey alluvium. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark grayish-brown silty clay loam about 7 inches thick. The upper 41 inches of the subsoil is dark grayish-brown silty clay or clay mottled with dark yellowish brown in the lower part. To a depth of 60 inches is olive-gray clay mottled with dark brown.

Representative profile of Leeper silty clay loam, in an area used for crops, 2 miles west of Abbott and 100 yards east of Mississippi Highway 47, SE¼SW¼ sec. 17, T. 16 S., R. 5 E.

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silty clay loam; moderate, medium, subangular blocky structure; friable, sticky and plastic; many fine roots; many fine worm casts; mildly alkaline; clear, smooth boundary.

B21—7 to 22 inches, dark grayish-brown (10YR 4/2) silty clay; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; mildly alkaline; clear, smooth boundary.

B22—22 to 26 inches, dark grayish-brown (2.5Y 4/2) clay; weak, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; mildly alkaline; clear, smooth boundary.

B23—26 to 48 inches, dark grayish-brown (10YR 4/2) clay; common medium, distinct, dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; mildly alkaline; clear, smooth boundary.

B24g—48 to 60 inches, olive-gray (5Y 5/2) clay; many coarse, distinct, dark-brown (7.5YR 4/4) mottles; weak, medium, subangular blocky structure; firm, sticky and plastic; few fine, brown concretions; mildly alkaline.

There are few to many brown and black concretions in the lower part of the soil. Reaction throughout ranges from medium acid through moderately alkaline.

The Ap horizon is dark brown, dark grayish brown, very dark grayish brown, or grayish brown.

The upper part of the B horizon is grayish brown or dark grayish

brown, and the lower part is olive gray, dark grayish brown, grayish brown, or gray mottled with dark yellowish brown, dark brown, and olive brown. The B horizon is silty clay, clay, or silty clay loam. Clay content between depths of 10 and 40 inches ranges from 35 to 60 percent.

Leeper soils are near Belden, Griffith, Tuscumbia, and Una soils. They are more clayey in the B horizon than Belden soils. They are not so well drained as, and lack the thick, dark surface layer of, Griffith soils. Leeper soils are better drained than Tuscumbia soils. They are better drained and more alkaline throughout than Una soils.

Le—Leeper silty clay loam. This somewhat poorly drained soil is on flood plains. It has the profile described as representative of the series. Slopes are 0 to 2 percent. Included in mapping are small areas of Belden, Griffith, Tuscumbia, and Una soils.

Reaction is medium acid through moderately alkaline. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow, and the hazard of erosion is slight in cultivated areas. Tilth is difficult to maintain. The soil can be cultivated only within a narrow range of moisture content. Flooding commonly occurs in winter, early in spring, and occasionally during the growing season.

Row crops can be grown year after year by following good conservation practices. Graded rows and surface field ditches are needed to remove excess surface water.

If this soil is adequately drained and fertilized, it is well suited to cotton, corn, soybeans, and pasture. Most areas are cultivated or are used for pasture, but a few are wooded. Capability unit IIw-1; woodland group 1w6.

Longview Series

The Longview series consists of somewhat poorly drained soils on uplands. These soils formed in loamy materials high in silt. Slopes are 0 to 5 percent.

In a representative profile the surface layer is dark grayish-brown silt loam about 4 inches thick. The subsurface layer is brown silt loam about 4 inches thick. The subsoil extends to a depth of 80 inches. The upper 13 inches of the subsoil is yellowish-brown silt loam mottled with light brownish gray. The next 30 inches is silt loam mottled in shades of brown and gray. Below this is silty clay loam mottled in shades of brown and gray.

Representative profile of Longview silt loam, 0 to 2 percent slopes, in an area used for crops, 2 miles east of Pheba and 25 yards south of Mississippi Highway 50, NW¼SW¼ sec. 23, T. 20 N., R. 13 E.

Ap—0 to 4 inches, dark grayish-brown (10YR 4/2) silt loam; few, fine and medium, distinct, yellowish-brown (10YR 5/4) mottles; weak, fine, granular structure; friable; few fine roots; few fine brown and black concretions; neutral; clear, smooth boundary.

A2—4 to 8 inches, brown (10YR 5/3) silt loam; weak, fine, granular structure; friable; few fine roots; few fine brown and black concretions; very strongly acid; clear, smooth boundary.

B21t—8 to 16 inches, yellowish-brown (10YR 5/4) silt loam, common fine and medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; few fine brown and black concretions; very strongly acid; clear, smooth boundary.

B22t—16 to 21 inches, yellowish-brown (10YR 5/4) silt loam, many fine and medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; few fine brown and black concretions; very strongly acid; clear, smooth boundary.

B23t and A'2—21 to 32 inches, mottled light-gray (10YR 7/1) and yellowish-brown (10YR 5/6) silt loam; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; friable to firm; brown part slightly compact and brittle in about 20 percent of the volume; few fine roots; many fine pores; few thin patchy clay films; common gray silt coats on faces of peds, in pockets, and on faces of prisms; few fine brown and black concretions; very strongly acid; gradual, smooth boundary.

B24t—32 to 51 inches, mottled light-gray (10YR 7/1) and strong-brown (7.5YR 5/6) silt loam; moderate, fine and medium, prismatic structure parting to moderate, medium, subangular blocky; firm; slightly compact and brittle in about 30 percent of the volume; few fine voids; few patchy clay films; common gray silt coatings on faces of peds, in pockets, and on faces of prisms; few fine brown and black concretions; strongly acid; gradual, smooth boundary.

B25t—51 to 62 inches, mottled gray (10YR 6/1) and yellowish-brown (10YR 5/6) silty clay loam; moderate, medium, subangular blocky structure; firm, slightly sticky and plastic; patchy clay films on faces of peds; few fine brown and black concretions; strongly acid; gradual, smooth boundary.

B26t—62 to 80 inches, mottled yellowish-brown (10YR 5/6) and gray (10YR 6/1) silty clay loam; moderate, medium, subangular blocky structure; firm; few patchy clay films on faces of peds; few fine brown and black concretions; strongly acid.

Reaction is strongly acid or very strongly acid except for the surface layer in limed areas.

The Ap horizon is dark grayish brown, grayish brown, or brown. The A2 horizon is grayish brown, brown, or pale brown.

The upper part of the Bt horizon is yellowish brown and has few to many mottles in shades of gray and brown or is mottled in shades of yellow, brown, or gray. It is silt loam or silty clay loam. Clay content in the upper 20 inches of the B horizon ranges from 18 to 27 percent.

The lower part of the Bt horizon and the A'2 horizon are light gray or light brownish gray, or are mottled in shades of gray and brown. The lower part of the Bt horizon is gray, light brownish gray, or is mottled in shades of brown and gray. It is silty clay loam or silt loam.

Longview soils are near Mayhew, Ozan, Prentiss, and Stough soils. They have less clayey B horizons and are better drained than Mayhew soils. They are more silty and better drained than Ozan soils. Longview soils are more silty and lack the fragipan of Prentiss soils. They are more silty than Stough soils.

LoA—Longview silt loam, 0 to 2 percent slopes. This somewhat poorly drained soil is on broad upland flats. It has the profile described as representative of the series. Included in mapping are small areas of Mayhew, Ozan, Prentiss, and Stough soils.

Reaction is strongly acid or very strongly acid below the surface layer. Water moves through the soil moderately slowly. Available water capacity is high. Runoff is slow, and the hazard of erosion is slight. This soil is easy to till, but it cannot be cultivated over a wide range of moisture content without crusting or packing.

The soil can be rowcropped year after year if adequate conservation practices are used. Graded rows and surface field ditches are needed to remove excess surface water.

If the soil is adequately drained and fertilized, it is suited to corn, cotton, oats, soybeans, and pasture. Most of the acreage is cultivated or used for pasture, but a few areas are wooded. Capability unit IIw-3; woodland group 2w8.

LoB—Longview silt loam, 2 to 5 percent slopes. This somewhat poorly drained, gently sloping soil is on uplands. Included in mapping are small areas of Prentiss and Stough soils.

This soil has a surface layer of grayish-brown silt loam about 6 inches thick. The upper part of the subsoil, to a depth of 22 inches, is yellowish-brown silt loam mottled with light brownish gray. The lower part is silty clay loam

mottled in shades of brown and gray and extends to a depth of 65 inches or more.

Reaction is strongly acid or very strongly acid. Available water capacity is high. Water moves through the soil moderately slowly. Runoff is slow, and the hazard of erosion is slight to moderate. The soil is easy to till but it cannot be cultivated over a wide range of moisture content without crusting or packing.

If this soil is cropped, an adequate cropping system must be used to help control erosion. Good management includes using a suitable cropping system, cultivating on the contour, stripcropping, terracing, and keeping grass in waterways.

The soil is suited to cotton, corn, oats, soybeans, pasture, pine trees, and adapted hardwoods. Most areas of this soil are cleared and are cultivated. Capability unit IIe-3; woodland group 2w8.

Mathiston Series

The Mathiston series consists of somewhat poorly drained soils on flood plains. These soils formed in loamy alluvium high in silt. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark-brown silt loam about 6 inches thick. The subsoil to a depth of 13 inches is dark-brown silt loam mottled with grayish brown. Below this to a depth of 50 inches, it is grayish-brown silt loam and silty clay loam mottled with yellowish brown.

Representative profile of Mathiston silt loam, in an area used for crops, 3 miles west of Pheba and 200 feet north of Sun Creek, SE¼SE¼ sec. 23, T. 20 N., R. 12 E.

Ap—0 to 6 inches, dark-brown (10YR 4/3) silt loam; moderate, fine granular structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21—6 to 13 inches, dark-brown (10YR 4/3) silt loam; common medium, distinct, grayish-brown (10YR 5/2) mottles; weak, fine, subangular blocky structure; friable, slightly sticky; few fine roots; few fine brown and black concretions; very strongly acid; clear, wavy boundary.

B22g—13 to 22 inches, grayish-brown (10YR 5/2) silt loam; common fine, distinct, yellowish-brown (10YR 5/4) mottles; moderate, fine and medium, subangular blocky structure; friable, slightly sticky; few fine roots; few to common fine black and brown concretions; very strongly acid; gradual, smooth boundary.

B23g—22 to 31 inches, grayish-brown (10YR 5/2) silt loam; common medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable, slightly sticky; common fine and medium black and brown concretions; very strongly acid; gradual, smooth boundary.

B3g—31 to 50 inches, grayish-brown (10YR 5/2) silty clay loam; many medium, distinct, yellowish-brown (10YR 5/6) mottles; massive to weak, medium, subangular blocky structure; friable, slightly sticky; common fine and medium black and brown concretions; very strongly acid.

Reaction is strongly acid or very strongly acid except for the surface layer in limed areas.

The Ap horizon is brown, dark brown, or dark grayish brown.

The B21 horizon is brown or dark brown. There are mottles in some places and common grayish-brown mottles in others. The B22g and B23g horizons are dark grayish brown and grayish brown and contain few to many mottles in shades of brown. The B horizon is silt loam, loam, or silty clay loam. Clay content between depths of 10 to 40 inches ranges from 18 to 30 percent.

Mathiston soils are near Belden and Urbo soils. They are more acid in the B horizon than Belden soils. They have a less clayey B horizon than Urbo soils.

Ma—Mathiston silt loam. This somewhat poorly drained soil is on flood plains. Slopes are 0 to 2 percent. Included in mapping are small areas of Belden and Urbo soils.

Reaction is strongly acid to very strongly acid. Available water capacity is high. Water moves through the soil at a moderate rate. Runoff is slow, and the hazard of erosion is slight in cultivated areas. The soil is easy to cultivate throughout a moderate range of moisture content. Flooding commonly occurs in winter, early in spring, and occasionally during the growing season.

If this soil is adequately fertilized and is well managed, it can be cropped year after year. Graded rows and surface field ditches are needed to remove excess surface water.

If this soil is adequately drained and fertilized, it is well suited to cotton, corn, soybeans, and pasture. Most areas are cultivated or are used for pasture. A few areas are wooded. Capability unit IIw-6; woodland group 1w8.

Mayhew Series

The Mayhew series consists of poorly drained soils on uplands. These soils formed in clayey material. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark grayish-brown silt loam about 5 inches thick. The subsoil extends to a depth of 48 inches or more. The upper 31 inches of the subsoil is light brownish-gray clay. The lower part is pale-olive clay.

Representative profile of Mayhew silt loam, 0 to 2 percent slopes, in an area of woodland, 2½ miles east of Natchez Trace Parkway, NW¼NE¼ sec. 33, T. 15 S., R. 3 E.

A1—0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; few fine, faint, grayish-brown mottles; weak, fine, granular structure; friable, slightly plastic; many fine roots; strongly acid; clear, smooth boundary.

B21tg—5 to 12 inches, light brownish-gray (2.5Y 6/2) clay; moderate, fine and medium, angular and subangular blocky structure; firm, sticky and plastic; few fine roots; thin clay films or pressure faces on peds; worm casts and root channels filled with material from A1 horizon; strongly acid; clear, smooth boundary.

B22tg—12 to 30 inches, light brownish-gray (2.5Y 6/2) clay; moderate, fine and medium, angular and subangular blocky structure; firm, very sticky and very plastic; few fine roots; thin clay films or pressure faces on peds; few slickensides that do not intersect; strongly acid; clear, wavy boundary.

B23tg—30 to 36 inches, light brownish-gray (2.5Y 6/2) clay; common fine and medium, distinct, pale-olive (5Y 6/3) mottles; weak, fine and medium, angular and subangular blocky structure; firm, very sticky and very plastic; few fine roots; thin clay films or pressure faces on peds; slickensides that do not intersect; strongly acid; clear, wavy boundary.

B24tg—36 to 48 inches, pale-olive (5Y 6/3) clay; weak, fine and medium, angular and subangular blocky structure; firm, very sticky and very plastic; thin clay films or pressure faces on peds; strongly acid; many shale fragments.

Reaction is medium acid to very strongly acid except in the surface layer in areas that have been limed.

The A1 horizon is very dark gray, dark grayish brown, or brown.

The upper part of the B horizon is light brownish gray, gray, or light gray. The lower part is similar to the upper part or is pale olive or olive gray. The subsoil is silty clay, silty clay loam, or clay. Clay content in the upper 20 inches of the B horizon ranges from 35 to 60 percent.

Mayhew soils are near Longview, Ozan, Tippah, and Wilcox soils. They are not so well drained as Longview and Tippah soils, and the upper part of the B horizon is more clayey. Mayhew soils have colors similar to Ozan soils but the upper part of the B horizon is more

clayey. Mayhew soils are grayer in the upper part of the B horizon than Wilcox soils.

MhA—Mayhew silt loam, 0 to 2 percent slopes. This poorly drained soil is on broad flats on uplands. Included in mapping are small areas of Longview, Tippah, and Wilcox soils.

Reaction is medium acid to very strongly acid. Available water capacity is high. Water moves through the soil very slowly. Tilth is fairly easy to maintain.

If this soil is adequately drained, it can be cropped year after year provided good conservation practices are used. Graded rows and surface field ditches are needed to remove excess surface water.

This soil is suited to sweet potatoes, soybeans, oats, and pasture if it is adequately drained and fertilized. About one-half of the acreage is cultivated or is used for pasture. The rest is in mixed hardwoods or pine trees. Capability unit IIIw-1; woodland group 2w9.

Okolona Series

The Okolona series consists of well-drained soils on uplands. These soils formed in clayey material. Slopes are 0 to 3 percent.

In a representative profile the surface layer is dark olive-gray silty clay in the upper 17 inches and olive-gray silty clay in the lower 16 inches. The next layer is light olive-brown silty clay mottled with dark grayish brown. Below this is mottled light olive-brown and dark grayish-brown silty clay that extends to a depth of 65 inches or more.

Representative profile of Okolona silty clay, 0 to 1 percent slopes, in an area used for crops, 2½ miles north of West Point, Mississippi, and 500 feet in cultivated field, NE¼SE¼ sec. 35, T. 16 S., R. 6 E.

Ap—0 to 8 inches, dark olive-gray (5Y 3/2) silty clay; massive; very firm, very plastic; few fine roots; few fine calcium carbonate nodules; moderately alkaline; abrupt, wavy boundary.

A11—8 to 17 inches, dark olive-gray (5Y 3/2) silty clay; moderate, medium, prismatic structure parting to moderate, medium and fine, subangular blocky; very firm, sticky and very plastic; few fine roots; few fine calcium carbonate nodules; moderately alkaline; gradual, wavy boundary.

A12—17 to 33 inches, olive-gray (5Y 4/2) silty clay ped exterior, olive (5Y 4/3) ped interior; moderate, medium, prismatic structure parting to moderate, medium, angular and subangular blocky; very firm, sticky and very plastic; few fine roots; few fine brown concretions; shiny faces on peds; few crawfish burrows; moderately alkaline; clear, irregular boundary.

AC1—33 to 38 inches, light olive-brown (2.5Y 5/4) silty clay; common medium, distinct, dark grayish-brown (2.5Y 4/2) coatings; intersecting slickensides parting to fine wedge-shaped fragments; very firm, sticky and very plastic; few fine roots; few fine calcium carbonate nodules; few fine brown concretions; few crawfish burrows; moderately alkaline; clear, irregular boundary.

AC2—38 to 65 inches, mottled light olive-brown (2.5Y 5/4) and dark grayish-brown (2.5Y 4/2) silty clay; intersecting slickensides parting to fine wedge-shaped fragments; very firm, sticky and very plastic; few fine roots; common fine and coarse calcium carbonate nodules; moderately alkaline. (Water table at a depth of 60 inches)

Clay content between depths of 10 and 40 inches is 40 to 55 percent. Intersecting slickensides are at depths between 15 to 35 inches. Cycles of microbasins and microknolls are repeated about every 7 to 20 feet. Very dark grayish-brown or dark olive-brown horizons are 16 to 25 inches thick in the centers of the microbasins and 8 to 14 inches thick in the centers of the microknolls.

The AP and A11 horizons are very dark gray, very dark grayish brown, or dark olive gray. The A12 horizon is olive gray or dark olive gray. Reaction in the A horizon is neutral or moderately alkaline.

The AC horizon is light olive brown, dark grayish brown, olive brown, olive, olive gray, or grayish brown. Some profiles are mottled in shades of brown and gray in the lower part. Reaction in the AC horizon is mildly or moderately alkaline. It is silty clay or clay. The extremes of amplitude (waviness) of the boundary between the A and AC horizons vary from 8 inches at the centers of the microknolls to 33 inches at the centers of the microbasins.

Okolona soils are near Binnsville, Brooksville, Griffith, and Sumter soils. They are thicker than Binnsville soils. Okolona soils are more alkaline in the upper part and better drained than Brooksville soils. They are better drained than Griffith soils. They lack the yellowish-brown B horizon of Sumter soils.

OkA—Okolona silty clay, 0 to 1 percent slopes. This well-drained soil is on broad ridgetops. It has the profile described as representative of the series. Included in mapping are small areas of Brooksville and Sumter soils.

Reaction is neutral to moderately alkaline. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow, and the hazard of erosion is slight in cultivated areas. Tilth is hard to maintain because the soil shrinks and cracks as it dries and it can be worked only within a narrow range of moisture content without clodding and crusting.

This soil can be cropped year after year if good conservation practices are used. Graded rows are needed to help remove excess surface water. The proper use of crop residue is beneficial to tilth.

Cotton, corn, soybeans, oats, and pasture are well suited if adequate amounts of fertilizer are applied. Most of the acreage is used for row crops or pasture. Capability unit IIs-1; woodland group 4c2c.

OkB—Okolona silty clay, 1 to 3 percent slopes. This is a gently sloping, well-drained clayey soil. A few shallow gullies and rills are in some areas. Included in mapping are small areas of Brooksville, Kipling, and Sumter soils.

The surface layer is very dark gray silty clay about 8 inches thick. The subsoil is very dark grayish-brown silty clay about 12 inches thick. Below this, and extending to a depth of 50 inches, is olive-gray clay mottled with olive. This is underlain by mottled olive and gray clay that extends to a depth of 60 inches or more.

Reaction is neutral to moderately alkaline. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow to medium, and the hazard of erosion is moderate. This soil shrinks and cracks as it dries. It can be cultivated only within a narrow range of moisture content.

If this soil is cultivated, a suitable cropping system is needed to help control erosion. Good management includes cultivating on the contour, stripcropping, terracing, and keeping grass in waterways.

This soil is suited to cotton, corn, oats, soybeans, and pasture if adequate amounts of fertilizer are applied. Most of the acreage is used for row crops or pasture (fig. 5). Capability unit IIe-2; woodland group 4c2c.

Ora Series

The Ora series consists of moderately well drained soils that have a fragipan. These soils formed in loamy material. Slopes are 2 to 12 percent.

In a representative profile the surface layer is dark yellowish-brown loam about 6 inches thick. The subsoil extends to a depth of 56 inches or more. The upper 4 inches

Figure 5.—Cattle grazing tall fescue on Okolona silty clay, 1 to 3 percent slopes.

is yellowish-brown loam, the next 16 inches is yellowish-red loam, the next 9 inches is a brittle, compact layer of dark yellowish-brown loam mottled with pale brown, and the lower part is a brittle, compact layer of sandy loam mottled in shades of brown.

Representative profile of Ora loam, 2 to 5 percent slopes, in an area of pasture, 1 mile east of Mississippi Highway 47, NW¼NE¼ sec. 1, T. 15 S., R. 4 E.

Ap—0 to 6 inches, dark yellowish-brown (10YR 4/4) loam; weak, fine, granular structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B1—6 to 10 inches, yellowish-brown (10YR 5/4) loam; weak, medium, subangular blocky structure; friable; common fine roots; strongly acid; abrupt, smooth boundary.

B2t—10 to 26 inches, yellowish-red (5YR 4/6) loam; moderate, medium, subangular blocky structure; friable; common fine roots; patchy clay films on faces of peds; strongly acid; abrupt, wavy boundary.

Bx1—26 to 35 inches, dark yellowish-brown (10YR 4/4) loam; common medium, distinct, pale-brown (10YR 6/3) mottles; weak, coarse prismatic structure parting to moderate, medium, subangular blocky; firm, hard, brittle, and compact; thin, continuous clay films on faces of prisms; pockets of uncoated sand grains between prisms; common fine black concretions; strongly acid; clear, wavy boundary.

Bx2—35 to 56 inches, mottled yellowish-brown (10YR 5/6), pale-brown (10YR 6/3), and dark-brown (7.5YR 4/4) sandy loam; weak, coarse, prismatic structure parting to moderate, medium, subangular blocky; firm, hard, brittle, and compact; patchy clay films on faces of prisms; pockets of uncoated sand grains between prisms; few black concretions; strongly acid.

Depth to the fragipan ranges from 20 to 36 inches. Few to many small concretions are in the fragipan. Except for the surface layer in areas that have been limed, the entire soil is extremely acid to strongly acid.

The A horizon is dark grayish brown, grayish brown, brown, dark yellowish brown, or yellowish brown.

The B1 horizon, if present, is strong brown, yellowish brown, or yellowish red. The Bt horizon is reddish-brown, red, or yellowish-red loam, clay loam, or sandy clay loam. Clay content from the top of the Bt horizon to the upper boundary of the Bx (fragipan) horizon ranges from 18 to 30 percent. The Bx horizon is dark yellowish brown, yellowish red, or yellowish brown, or it is mottled in shades of red, brown, and gray. It is loam, sandy clay loam, or sandy loam.

Ora soils are near Prentiss, Ruston, and Sweatman soils. Sweatman soils have a more clayey Bt horizon. Ora soils have a fragipan that is absent in Ruston and Sweatman soils. They are redder than Prentiss soils and have a clay content of 18 to 30 percent in the upper 20 inches of the Bt horizon.

OrB—Ora loam, 2 to 5 percent slopes. This moderately well drained soil is on ridgetops. It has the profile described as representative of the series. Included in mapping are small areas of Prentiss and Ruston soils.

Reaction is strongly acid to extremely acid. Available water capacity is medium. Water moves at a moderate rate through the upper part of the subsoil, but it moves

moderately slowly through the fragipan. Runoff is slow to medium, and the hazard of erosion is moderate. Tilth is easy to maintain. This soil can be worked throughout a wide range of moisture content without clodding and crusting.

This soil can be cropped year after year if it is well managed. Good management includes cultivating on the contour, stripcropping, terracing, and keeping grass in the waterways.

If adequate amounts of fertilizers are applied, this soil is suited to cotton, corn, oats, soybeans, and pasture. Most of the acreage is used for row crops and pasture. Capability unit IIe-5; woodland group 3o7.

OrC2—Ora loam, 5 to 8 percent slopes, eroded. This moderately well drained soil is on narrow ridgetops and upper side slopes. Most areas have rills and a few shallow gullies. Included in mapping are small areas of Ruston soils.

This soil has a surface layer of brown loam about 6 inches thick. The subsoil is yellowish-red loam. At a depth of about 22 inches, there is a brittle loam and sandy clay loam fragipan that is yellowish brown in the upper part and mottled in shades of red, yellow, and gray in the lower part.

Reaction is strongly acid or extremely acid. Available water capacity is medium. Water moves at a moderate rate through the upper part of the subsoil, but it moves moderately slowly through the fragipan. Runoff is medium, and the hazard of erosion is moderate to severe in cultivated areas. Good tilth can be maintained by proper use of crop residues. This soil can be worked throughout a wide range of moisture content.

This soil can be cropped if good conservation practices are followed. Good management includes keeping grass in waterways, terracing, farming on the contour, proper tillage, and other erosion control measures.

Cotton, corn, oats, soybeans, and pasture plants are suited to this soil if adequate amounts of fertilizer are applied. Most areas are used for row crops or pasture. Capability unit IIIe-4; woodland group 3o7.

OrD2—Ora loam, 8 to 12 percent slopes, eroded. This moderately well drained soil is on short side slopes. Most areas have rills and a few shallow and deep gullies. Included in mapping are small areas of Ruston and Sweatman soils.

This soil has a surface layer of dark yellowish-brown loam about 2 inches thick. The subsoil is yellowish-red loam. At a depth of about 20 inches, there is a brittle, loam fragipan that is mottled in shades of red, brown, and gray.

Reaction is strongly acid or very strongly acid. Available water capacity is medium. Water moves through the upper part of the subsoil at a moderate rate and through the fragipan moderately slowly. Runoff is rapid, and the hazard of erosion is severe in cultivated areas. Tilth is generally fair. This soil can be worked throughout a fairly wide range of moisture content.

Steep slopes and the hazard of further erosion make the soil poorly suited to row crops. It is better suited to pasture and pine trees than to cultivated crops. Some areas of this soil were formerly cultivated, but they are now mainly used for pasture and pine trees. Capability unit IVe-2; woodland group 3o7.

Ozan Series

The Ozan series consists of poorly drained soils on uplands. These soils formed in loamy material. Slopes are 0 to 2 percent.

In a representative profile the surface layer is brown sandy loam about 7 inches thick. The subsurface layer is light brownish-gray sandy loam mottled in shades of brown about 12 inches thick. The subsoil is loam and sandy clay loam and extends to a depth of 80 inches or more. It is light brownish gray in the upper 18 inches and gray mottled in shades of brown in the lower 43 inches.

Representative profile of Ozan sandy loam, in an area 3½ miles southeast of Una and one-fourth mile north of local road, NE¼NE¼ sec. 22, T. 15 S., R. 5 E.

Ap—0 to 7 inches, brown (10YR 5/3) sandy loam; weak, fine and medium, granular structure; friable; many fine and medium roots; medium acid; clear, smooth boundary.

A21g&B21tg—7 to 19 inches, light brownish-gray (2.5Y 6/2) sandy loam; many medium, distinct, yellowish-brown (10YR 5/4) and dark yellowish-brown (10YR 4/4) mottles; weak, medium, subangular blocky structure; friable; few fine roots; common fine pores; some bridging and coating of sand grains in brown part; strongly acid; gradual, smooth boundary.

B22tg&A22g—19 to 37 inches, light brownish-gray (2.5Y 6/2) loam; common medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, medium, subangular blocky; friable; few fine roots; many fine pores; bridging and coating of sand grains with clay; strongly acid; gradual, wavy boundary.

B23tg—37 to 58 inches, gray (10YR 5/1) loam; common medium, distinct, strong-brown (7.5YR 5/6) and dark-brown (7.5YR 4/4) mottles; moderate, medium and coarse, prismatic structure parting to weak, medium, subangular blocky; friable; tongues of sandy loam 1 to 3 inches in diameter occur every 5 to 6 inches; clay films on faces of prisms; common fine black and brown concretions; strongly acid; gradual, wavy boundary.

B24tg—58 to 80 inches, gray (10YR 5/1) sandy clay loam; common medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, prismatic structure parting to weak, medium, subangular blocky; friable; tongues of sandy loam 1 to 3 inches in diameter occur every 5 to 6 inches; clay films on faces of prisms; few fine black and brown concretions; medium acid.

Reaction is medium acid through very strongly acid except for the surface layer in areas that have been limed.

The Ap or A1 horizon is brown, very dark gray, dark grayish brown, or grayish brown. The A2&B2 horizon is grayish-brown, light brownish-gray, or gray sandy loam or silt loam.

The B2&A2 and Bt horizons are gray or light brownish-gray loam, sandy clay loam, or sandy loam. Clay content in the upper 20 inches of the B horizon is between 10 and 18 percent.

Ozan soils are near Longview, Mayhew, Prentiss, and Stough soils. Ozan soils are grayer and not so well drained as Longview, Prentiss, and Stough soils. They have a less clayey B horizon than Mayhew soils.

Oz—Ozan sandy loam. This poorly drained, nearly level soil is on uplands. Included in mapping are small areas of Prentiss and Stough soils.

Reaction is medium acid through very strongly acid. Available water capacity is medium. Water moves through the soil slowly. Runoff is slow, and the hazard of erosion is slight.

Because this soil is poorly drained, it is poorly suited to row crops. Where it is cultivated, excess surface water is a concern. Graded rows and surface field ditches help to remove excess surface water.

Most of the commonly grown pasture plants and hardwoods are suited to this soil. Most soils are in hardwoods

and pasture. A small acreage is in row crops. Capability unit IIIw-2; woodland group 2w9.

Prentiss Series

The Prentiss series consists of moderately well drained soils that have a fragipan. These soils formed in loamy material. Slopes are 0 to 5 percent.

In a representative profile the surface layer is dark grayish-brown sandy loam about 4 inches thick. The subsurface layer is light yellowish-brown sandy loam about 6 inches thick. The subsoil is yellowish-brown loam to a depth of about 26 inches. Below this is a brittle, compact layer 34 inches thick or more. This layer is yellowish-brown loam mottled with light brownish gray in the upper part and loam mottled in shades of brown, gray, and red in the lower part.

Representative profile of Prentiss sandy loam, 2 to 5 percent slopes, in an area of woodland 1 mile southeast of Una, SW¼SW¼ sec. 9, T. 15 S., R. 5 E.

A1—0 to 4 inches, dark grayish-brown (10YR 4/2) sandy loam; common fine and medium, distinct, pale-brown (10YR 6/3) mottles; weak, fine granular structure; friable; many fine roots; strongly acid; clear, smooth boundary.

A2—4 to 10 inches, light yellowish-brown (10YR 6/4) sandy loam; weak, fine and medium, subangular blocky structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21—10 to 20 inches, yellowish-brown (10YR 5/6) loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; clear, smooth boundary.

B22—20 to 26 inches, yellowish-brown (10YR 5/6) loam; few fine and coarse, pale-brown (10YR 6/3) mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; strongly acid; clear, smooth boundary.

Bx1—26 to 36 inches, yellowish-brown (10YR 5/6) loam; common to many fine and medium, distinct, light brownish-gray (10YR 6/2) mottles; weak, coarse prismatic structure parting to moderate, fine and medium, subangular blocky; firm, slightly compact and brittle in about 60 percent of the volume; few fine roots; patchy clay films on faces of prisms; sand grains coated and bridged with clay; strongly acid; clear, wavy boundary.

Bx2—36 to 48 inches, mottled yellowish-brown (10YR 5/6), light brownish-gray (10YR 6/2), and yellowish-red (5YR 4/6) loam; weak, coarse, prismatic structure parting to moderate, fine and medium, subangular blocky; firm, slightly compact and brittle in about 60 percent of the volume; patchy clay films on faces of prisms; sand grains bridged and coated with clay; strongly acid; clear, wavy boundary.

Bx3—48 to 60 inches, mottled yellowish-brown (10YR 5/8) and light brownish-gray (10YR 6/2) loam; weak, coarse, prismatic structure parting to moderate, medium, subangular blocky; firm, slightly compact and brittle; few patchy clay films on faces of prisms; strongly acid.

Reaction is strongly acid or very strongly acid except for the surface layer in areas that have been limed.

The A1 or Ap horizon is dark grayish brown, brown, or dark yellowish brown. The A2 horizon, if present, is pale brown or light yellowish brown.

The B horizon is yellowish brown or light yellowish brown. It is loam or sandy loam. From a depth of 10 inches to the upper boundary of the Bx horizon (fragipan), the clay content ranges from 12 to 18 percent. The Bx horizon is yellowish brown or is mottled in shades of brown, red, and gray. It is loam, sandy loam, or fine sandy loam. Depth to the Bx horizon is 20 to 28 inches.

Prentiss soils are near Longview, Ora, Ozan, and Stough soils. They are better drained than Longview, Ozan, and Stough soils. They have less clay and are not so red in the B horizon as Ora soils.

PrA—Prentiss sandy loam, 0 to 2 percent slopes. This moderately well drained soil is on broad, flat ridgetops. Included in mapping are small areas of Longview, Ora, Ozan, and Stough soils.

This soil has a surface layer of grayish-brown sandy loam about 6 inches thick. The subsurface layer is yellowish-brown loam about 4 inches thick. The upper part of the subsoil is yellowish-brown silt loam, and the lower part is a mottled brown and gray loam fragipan at a depth of about 27 inches.

Reaction is strongly acid or very strongly acid. Available water capacity is medium. Water moves through the upper part of the subsoil at a moderate rate, but it moves through the fragipan moderately slowly. Runoff is slow, and the hazard of erosion is slight in cultivated areas. Tilth is easy to maintain. This soil can be worked throughout a wide range of moisture content.

This soil can be cropped year after year if good conservation practices are used. Graded rows are needed to remove excess surface water.

Cotton, corn, oats, soybeans, and pasture are suited to this soil if it is adequately drained and fertilized. Pine trees and adapted hardwoods are also suited (fig. 6). Most areas are used for row crops and pasture. Capability unit IIw-2; woodland group 2o7.

PrB—Prentiss sandy loam, 2 to 5 percent slopes. This moderately well drained soil is on ridgetops. It has the profile described as representative of the series. Included in mapping are small areas of Ora and Stough soils.

Reaction is strongly acid or very strongly acid. Available water capacity is medium. Water moves through the upper part of the subsoil at a moderate rate, but it moves through the fragipan moderately slowly. Runoff is slow to medium, and the hazard of erosion is slight to moderate in cultivated areas. Tilth is easy to maintain. This soil can be worked throughout a wide range of moisture content.

This soil can be cropped year after year if a suitable cropping system is used. Cultivating on the contour, stripcropping, terracing, and keeping grass in waterways help to control erosion.

Cotton, corn, oats, soybeans, and pasture are suited to this soil if it is adequately fertilized. Pine trees and adapted hardwoods are also suited. Most areas are used for row crops or pasture. Capability unit IIe-5; woodland group 2o7.

Ruston Series

The Ruston series consists of well-drained soils on uplands. These soils formed in thick beds of loamy material. Slopes are 5 to 8 percent.

In a representative profile the surface layer is pale-brown fine sandy loam about 7 inches thick. The subsoil extends to a depth of 88 inches or more. It is yellowish-red loam in the upper 12 inches, yellowish-red loam mottled with pale brown in the next 19 inches, dark-red sandy loam in the next 20 inches, and dark-red sandy clay loam in the lower 30 inches.

Representative profile of Ruston fine sandy loam, 5 to 8 percent slopes, in an area of woodland 4½ miles northeast of Montpelier, SE¼SE¼ sec. 22, T. 15 S., R. 4 E.

Ap—0 to 7 inches, pale-brown (10YR 6/3) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

Figure 6.—**A stand of 34-year-old loblolly pine trees on Prentiss sandy loam, 0 to 2 percent slopes.**

B21t—7 to 19 inches, yellowish-red (5YR 4/6) loam; moderate, fine and medium, subangular blocky structure; friable; few fine roots; common patchy clay films on faces of peds; bridging and coating of sand grains with clay; strongly acid; gradual, smooth boundary.

B22t—19 to 38 inches, yellowish-red (5YR 4/8) loam; few fine and coarse pockets of pale-brown (10YR 6/3) sand; moderate, fine and medium, subangular blocky structure; friable; few fine roots; common patchy clay films on faces of peds; bridging of sand grains with clay; strongly acid; gradual, smooth boundary.

B23t&A'2—38 to 58 inches, dark-red (2.5YR 3/6) sandy loam; moderate, fine and medium, subangular blocky structure; very friable; few fine roots; many fine and coarse pockets of yellowish-red (5YR 4/6) loamy sand that make up about 12 percent of the horizon; common patchy clay films on faces of peds; bridging and coating of sand grains with clay; strongly acid; gradual, smooth boundary.

B'24t—58 to 88 inches, dark-red (2.5YR 3/6) sandy clay loam; moderate, fine and medium, subangular blocky structure; friable; common fine and coarse pockets of yellowish-red (5YR 5/8) loamy sand; common patchy clay films on faces of peds; bridging and coating of sand grains with clay; strongly acid.

Reaction is strongly acid or very strongly acid except for the surface layer in areas that have been limed.

The Ap horizon is pale brown, grayish brown, or yellowish brown. The upper part of the Bt horizon is yellowish-red or reddish-brown loam, clay loam, or sandy clay loam. The B2t&A'2 horizon is yellowish red or dark red mottled with pale brown. The lower part of the Bt horizon is red or dark-red loam or sandy clay loam. Clay content in the upper 20 inches of the B horizon ranges from 18 to 30 percent.

Ruston soils are near Ora and Smithdale soils. Ruston soils lack the fragipan of Ora soils. They have a B2&A'2 horizon and are more clayey in the lower B horizon than Smithdale soils.

RuC—Ruston fine sandy loam, 5 to 8 percent slopes. This well-drained soil is on the upper side slopes of ridges. It has the profile described as representative of the series. Included in mapping are small areas of Ora soils.

Reaction is strongly acid or very strongly acid. Available water capacity is medium. Water moves through this soil at a moderate rate. Runoff is medium, and the hazard of erosion is moderate. Good tilth can be maintained by proper use of crop residue. This soil can be cultivated throughout a wide range of moisture content without clodding. A plowpan may form if depth is not varied.

This soil can be cultivated if a suitable cropping system is used to control erosion. Where erosion is controlled, clean-tilled crops and close-growing crops can be grown in about equal amounts if contour strips and grass in waterways are used.

Cotton, corn, oats, soybeans, and pasture are suited to this soil if it is adequately fertilized. Most of the acreage is wooded, but a few areas are in pasture or row crops. Capability unit IIIe-1; woodland group 3o1.

Sessum Series

The Sessum series consists of poorly drained soils on uplands. These soils formed in clayey material. Slopes are 0 to 2 percent.

In a representative profile the surface layer is very dark grayish-brown silty clay about 4 inches thick. Below this, and extending to a depth of 62 inches or more, is gray clay mottled in shades of brown and olive.

Representative profile of Sessum silty clay, in an area used for crops, 5 miles east of U.S. Highway 45 and 200 feet south of county road, NW¼NW¼ sec. 28, T. 16 S., R. 7 E.

Ap—0 to 4 inches, very dark grayish-brown (10YR 3/2) silty clay; weak, fine, subangular blocky structure; firm, sticky and plastic; many fine roots; neutral; abrupt, smooth boundary.

B21tg—4 to 8 inches, gray (5Y 5/1) clay; few fine, distinct, strong-brown and pale-brown mottles; moderate, fine, angular and subangular blocky structure; firm, very sticky and very plastic; few fine roots; continuous clay films or pressure faces on peds; neutral; clear, smooth boundary.

B22tg—8 to 13 inches, gray (5Y 6/1) clay; common medium, distinct, olive-brown (2.5Y 4/4) and strong-brown (7.5YR 5/6) mottles; moderate, fine and medium, subangular blocky structure; firm, very sticky and very plastic; few fine roots; continuous clay films or pressure faces on peds; few slickensides that do not intersect; very strongly acid; clear, smooth boundary.

B23tg—13 to 20 inches, gray (5Y 6/1) clay; few fine, faint, pale-olive and strong-brown mottles; strong angular and subangular blocky structure; firm, very sticky and very plastic; few fine roots; continuous clay films or pressure faces on peds; few slickensides that do not intersect; very strongly acid; clear, smooth boundary.

B24tg—20 to 44 inches, gray (5Y 6/1) clay; few, fine, faint, pale-olive mottles; moderate, fine and medium, angular and subangular blocky structure; firm, very sticky and very plastic; few fine roots; continuous clay films or pressure faces on peds; few fine

brown concretions; few slickensides that do not intersect; very strongly acid; clear, smooth boundary.

Cg—44 to 62 inches, gray (5Y 6/1) clay; intersecting slickensides parting to wedge-shaped fragments; firm, very sticky and very plastic; few fine roots; medium acid.

Reaction is medium acid through very strongly acid in the upper part of the profile except for the surface layer in areas that have been limed. It is medium acid to moderately alkaline in the C horizon.

The Ap horizon is dark grayish brown or very dark grayish brown.

The B horizon is gray or dark-gray clay, silty clay, or silty clay loam that contains between 50 and 60 percent clay.

Sessum soils are near Brooksville and Kipling soils. Sessum soils are grayer and not so well drained as Brooksville and Kipling soils.

Se—Sessum silty clay. This poorly drained soil is on broad flats on uplands. Slopes are 0 to 2 percent. Included in mapping are small areas of Kipling soils.

Reaction is very strongly acid through moderately alkaline. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow, and the hazard of erosion is slight. Tilth is not easily maintained. This soil shrinks and forms cracks as it dries and swells as it becomes wet. It can be worked within only a narrow range of moisture content without clodding and crusting. Shredding crop residue and leaving it on the surface helps improve tilth.

This soil can be rowcropped year after year if adequate conservation practices are used. Graded rows and surface field ditches are needed to remove excess surface water.

If this soil is adequately fertilized, it is suited to soybeans and pasture. About half of the acreage is cultivated or is used for pasture. The rest is in woodland. Capability unit IVw-2; woodland group 3c8.

Smithdale Series

The Smithdale series consists of well-drained soils on uplands. These soils formed in loamy material. Slopes range from 5 to 40 percent.

In a representative profile the surface layer is dark grayish-brown fine sandy loam about 5 inches thick. The subsurface layer is yellowish-brown sandy loam about 7 inches thick. The subsoil extends to a depth of 80 inches or more. The upper 16 inches is red sandy clay loam, and the lower 52 inches is red sandy loam.

Representative profile of Smithdale fine sandy loam, in an area of Smithdale-Ruston association, hilly, in a wooded area, 1 mile east of fire tower and 100 feet east of local road, NE¼NE¼ sec. 27, T. 15 S., R. 4 E.

A1—0 to 5 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, smooth boundary.

A2—5 to 12 inches, yellowish-brown (10YR 5/6) sandy loam; weak, fine granular structure; very friable; few fine roots; strongly acid; clear, smooth boundary.

B21t—12 to 28 inches, red (2.5YR 4/6) sandy clay loam; moderate, fine and medium, subangular blocky structure; friable; few fine roots; common thin, continuous clay films on faces of peds; strongly acid; clear, smooth boundary.

B22t—28 to 40 inches, red (2.5YR 5/8) sandy loam; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; few fine mica flakes; strongly acid; clear, smooth boundary.

B23t—40 to 60 inches, red (2.5YR 5/8) sandy loam; common medium, distinct, strong-brown (7.5YR 5/8) mottles; weak, medium, subangular blocky structure; very friable; sand grains bridged and coated with clay; few pockets of uncoated sand grains; few fine mica flakes; strongly acid; clear, smooth boundary.

B24t—60 to 80 inches, red (2.5YR 5/8) sandy loam; weak, medium, subangular blocky structure; very friable; sand grains bridged and coated with clay; few fine mica flakes; strongly acid.

Reaction is strongly acid or very strongly acid throughout the profile.

The A1 horizon is dark grayish brown, grayish brown, or dark brown. The Ap or A2 horizon is brown, grayish brown, pale brown, or yellowish brown.

The upper part of the Bt horizon is red or yellowish-red clay loam, sandy clay loam, or loam. Clay content in the upper 20 inches of the Bt horizon ranges between 18 and 32 percent, and silt content, between 15 and 50 percent. The lower part of the Bt horizon has colors similar to those in the upper part of the Bt horizon, except there are few to many pockets of uncoated sand grains. The lower part of the Bt horizon is loam or sandy loam.

Smithdale soils are near Ora, Ruston, and Sweatman soils. Smithdale soils lack the fragipan of Ora soils. They have less clay in the lower part of the B horizon and do not have B'2 and A'2 horizons of Ruston soils. They have less clayey Bt horizons than Sweatman soils.

SRE—Smithdale-Ruston association, hilly. This association consists of well-drained soils on rough, hilly uplands. Areas are 160 to 800 acres in size. Most areas are wooded and consist of long winding ridges and side slopes that are cut by natural drainageways. Slopes range from 5 to 40 percent. Composition of this unit is more variable than most others in the county. Mapping has been controlled well enough, however, for the anticipated use of the soils.

This association is 65 percent Smithdale soils and 25 percent Ruston soils. The remaining 10 percent is well-drained soils that have a subsoil of yellowish-red sandy loam or loam and soils that have a similar subsoil but that have a sandy surface layer 20 to 60 inches thick. The pattern and extent of Smithdale and Ruston soils are fairly uniform throughout the mapped area.

Included in mapping are a few small areas that are less than 160 acres and a few areas of eroded soils that were once cultivated.

The well-drained Smithdale soils are on the middle and lower slopes. They have the profile described as representative of the series. Reaction is strongly acid or very strongly acid. Available water capacity is medium. Water moves through the soil at a moderate rate. Runoff is rapid.

The well-drained Ruston soils are on ridgetops and upper slopes. The Ruston soils have a surface layer of yellowish-brown fine sandy loam about 4 inches thick. The upper 17 inches of the subsoil is yellowish-red sandy clay loam. The next layer is yellowish-red loam about 9 inches thick. Below this is yellowish-red sandy clay loam that extends to a depth of 80 inches. Reaction is strongly acid or very strongly acid. Available water capacity is medium. Water moves through the soil at a moderate rate.

Most areas are wooded. This unit is better suited to pine trees than other trees because of slopes. The dominant trees are loblolly and shortleaf pine. Capability unit VIIe-1; woodland group 3o1.

Stough Series

The Stough series consists of somewhat poorly drained soils on uplands. These soils formed in loamy material. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark grayish-brown sandy loam about 5 inches thick. The subsoil extends to a depth of about 57 inches or more. The upper 21 inches is yellowish-brown loam mottled with pale brown and light brownish gray. The lower 31 inches is loam

mottled in shades of brown and gray.

Representative profile of Stough sandy loam, 0 to 2 percent slopes, in an area used for pasture, 3 miles southeast of Una, NE¼SW¼ sec. 14, T. 15 S., R. 5 E.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) sandy loam; few to common fine, distinct, yellowish-brown mottles; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

B21t—5 to 15 inches, yellowish-brown (10YR 5/4) loam; many fine and medium, distinct, pale-brown (10YR 6/3) and light brownish-gray (10YR 6/2) mottles; weak, fine, subangular blocky structure; friable; few fine roots; few patchy clay films on faces of peds; sand grains bridged and coated with clay; few fine brown and black concretions; very strongly acid; clear, smooth boundary.

B22t—15 to 26 inches, yellowish-brown (10YR 5/4) loam; common fine and medium, light brownish-gray (10YR 6/2) and pale-brown (10YR 6/3) mottles; weak, prismatic structure parting to moderate, fine, subangular blocky; friable, slightly brittle in about 50 percent of volume; few fine roots; few fine pores; patchy clay films on faces of prisms; sand grains bridged and coated with clay; few fine brown concretions; very strongly acid; clear, wavy boundary.

B23t—26 to 35 inches, mottled yellowish-brown (10YR 5/4) and light brownish-gray (10YR 6/2) loam; weak, coarse prismatic structure parting to moderate, medium, subangular blocky; friable, slightly brittle in about 50 percent of volume; few fine brown concretions; few fine pores; patchy clay films on faces of prisms; sand grains coated and bridged with clay; very strongly acid; clear, wavy boundary.

B24t—35 to 57 inches, mottled strong-brown (7.5YR 5/6), yellowish-brown (10YR 5/4), and gray (10YR 6/1) loam; weak, coarse, prismatic structure parting to moderate, medium, subangular blocky; friable, slightly brittle in about 40 percent of the volume; patchy clay films on faces of prisms; sand grains bridged and coated with clay; few fine brown concretions; very strongly acid.

Reaction is strongly acid or very strongly acid except for the surface layer in areas that have been limed.

The Ap horizon is dark grayish brown, pale brown, or yellowish brown. The upper part of the Bt horizon is yellowish brown or pale brown mottled in shades of gray and brown, and the lower part is mottled in shades of brown and gray. The Bt horizon is loam, fine sandy loam, sandy clay loam, or sandy loam. Clay content in the upper 20 inches of the Bt horizon ranges between 8 and 18 percent. The browner material of the lower part of the Bt horizon is brittle in about 40 to 55 percent of the volume.

Stough soils are near Longview, Ozan, and Prentiss soils. They are not so silty as Longview soils. Stough soils are not so gray as Ozan soils and are better drained. They are not so well drained as Prentiss soils.

StA—Stough sandy loam, 0 to 2 percent slopes. This poorly drained soil is on broad flats in terrace positions. Included in mapping are small areas of Longview, Ozan, and Prentiss soils.

Reaction is strongly acid or very strongly acid. Available water capacity is medium. Water moves through the soil moderately slowly. Runoff is slow, and the hazard of erosion is slight. The soil is easy to till, but it cannot be cultivated over a wide range of moisture content without crusting and packing.

This soil can be rowcropped year after year if adequate conservation practices are used. Graded rows and surface field ditches are needed to remove excess surface water.

If this soil is adequately drained and fertilized, it is suited to cotton, corn, oats, soybeans, pasture, pine trees, and adapted hardwoods. Most of the acreage is used for pasture or woodland. A few areas are cultivated. Capability unit IIw-3; woodland group 2w8.

Sumter Series

The Sumter series consists of well-drained soils on uplands. These soils formed in clayey material. Slopes are 2 to 12 percent.

In a representative profile the surface layer is olive-gray silty clay about 5 inches thick. The upper 5 inches of the subsoil is olive silty clay. The next layer is silty clay to a depth of 22 inches. It is pale yellow in the upper part and pale olive in the lower part. Below this is mottled pale-yellow, brownish-yellow, and white chalk.

Representative profile of Sumter silty clay, 2 to 5 percent slopes, eroded, in an area used for crops, 5 miles east of West Point, 100 yards south of Mississippi Highway 50, NE¼NW¼ sec. 14, T. 17 S., R. 7 E.

Ap—0 to 5 inches, olive-gray (5Y 5/2) silty clay; moderate, fine, granular structure; friable, plastic; many fine roots; few fine lime nodules; calcareous, mildly alkaline; abrupt, wavy boundary.

B1—5 to 10 inches, olive (5Y 5/6) silty clay; weak, medium, subangular blocky structure; friable, plastic; common fine roots; many fine, faint, light-gray and white chalk fragments; few fine lime nodules; calcareous, mildly alkaline; clear, wavy boundary.

B21—10 to 18 inches, pale-yellow (2.5Y 7/4) silty clay; weak, medium, subangular blocky structure; friable, sticky and plastic; few fine roots; many fine, distinct, light-gray and white chalk fragments; few fine lime nodules; calcareous, mildly alkaline; clear, irregular boundary.

B22—18 to 22 inches, pale-olive (5Y 6/4) silty clay; weak, medium, subangular blocky structure; firm, sticky and plastic; few fine, distinct, light yellowish-brown and white chalk fragments; calcareous, mildly alkaline; clear, irregular boundary.

C—22 to 54 inches, mottled pale-yellow (5Y 7/3), brownish-yellow (10YR 6/8), and white (2.5Y 8/2) chalk; rock-controlled structure; firm, sticky and plastic; can be dug with spade when moist; calcareous, mildly alkaline.

The Ap horizon is olive gray or olive.

The B horizon is olive, pale-olive, pale-yellow, or light olive-brown silty clay, clay, or silty clay loam. Clay content ranges between 35 to 60 percent. Reaction is mildly alkaline or moderately alkaline.

The C horizon is chalk. It is olive, olive yellow, or pale yellow, or is mottled in shades of brown, yellow, white, or gray.

Sumter soils are near Binnsville, Kipling, and Okolona soils. They have a less dark A horizon than Binnsville soils, which have chalk within 20 inches of the surface. Sumter soils are better drained and are not so brown as Kipling soils. They have a thinner, less dark A horizon and are thinner over chalk than Okolona soils.

SuB2—Sumter silty clay, 2 to 5 percent slopes, eroded. This well-drained, gently sloping soil is on ridgetops. It has the profile described as representative of the series. Rills and shallow gullies have formed in most areas, and there are a few deep gullies. Where cultivated, the surface layer is a mixture of the original surface layer and the upper part of the subsoil. Included in mapping are small areas of Binnsville soils.

Reaction is mildly alkaline or moderately alkaline. Available water capacity is low. Water moves through the soil slowly. Runoff is medium, and the hazard of erosion is slight to moderate. Good tilth is difficult to maintain. The soil shrinks and cracks as it dries and swells when wet. Use of crop residue is beneficial.

If this soil is cropped, an adequate cropping system must be used to help control erosion. Good management includes using a suitable cropping system, cultivating on the contour, stripcropping, terracing, and keeping grass in waterways.

The soil is suited to soybeans, pasture, redcedar, and osageorange trees. Most areas of this soil are cultivated or

used for pasture. Capability unit IIIe-2; woodland group 4c2c.

SuC2—Sumter silty clay, 5 to 12 percent slopes, eroded. This well-drained soil is on side slopes. Most areas are marked by rills, shallow gullies, and a few deep gullies. Included in mapping are small areas of Binnsville and Kipling soils.

This soil has a surface layer of olive silty clay about 3 inches thick. The upper 7 inches of the subsoil is light olive-brown silty clay. The next layer is pale-brown silty clay 26 inches thick. Below this is mottled yellow and olive chalk to a depth of 50 inches or more.

Reaction is mildly alkaline or moderately alkaline. Available water capacity is low. Water moves through the soil slowly. Runoff is rapid, and the hazard of erosion is severe. Good tilth is difficult to maintain. The soil shrinks and cracks as it dries and swells when wet.

Steep slopes and the hazard of further erosion make the soil poorly suited to row crops. It is better suited to pasture. Most areas of this soil were formerly cultivated, but they are now mainly used for pasture. Capability unit VIe-3; woodland group 4c2c.

Sweatman Series

The Sweatman series consists of well-drained soils on uplands. These soils formed in clayey material underlain by stratified layers of shale. Slopes are 5 to 40 percent.

In a representative profile the surface layer is pale-brown fine sandy loam about 4 inches thick. The upper 20 inches of the subsoil is red silty clay loam and silty clay that is mottled with pale brown and dark red between depths of 11 and 24 inches. The lower 14 inches of the subsoil is mottled pale-brown and red silty clay. The underlying material is stratified layers of yellowish-brown and strong-brown fine sandy loam and gray weathered shale that extends to a depth of 60 inches or more.

Representative profile of Sweatman fine sandy loam, 5 to 12 percent slopes, in a woodland area, 7 miles east of West Point and 1 mile west of Tombigbee River, NE¼SE¼ sec. 13, T. 17 S., R. 7 E.

Ap—0 to 4 inches, pale-brown (10YR 6/3) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

B21t—4 to 11 inches, red (2.5YR 4/6) silty clay loam; moderate, fine and medium, angular and subangular blocky structure; firm, sticky and plastic; few fine roots; patchy clay films on faces of peds; strongly acid; clear, smooth boundary.

B22t—11 to 24 inches, red (2.5YR 4/6) silty clay; common medium, distinct, pale-brown (10YR 6/3) and common medium, faint, dark-red (2.5YR 3/6) mottles; moderate, medium, angular blocky structure; firm, sticky and plastic; few fine roots; patchy clay films on faces of peds; strongly acid; clear, smooth boundary.

B3t—24 to 38 inches, mottled pale-brown (10YR 6/3) and red (2.5YR 4/6) silty clay; moderate, medium, angular blocky structure; firm, sticky and plastic; few fine roots; patchy clay films on faces of peds; many light brownish-gray shale fragments; strongly acid; clear, smooth boundary.

C—38 to 60 inches, stratified layers of yellowish-brown (10YR 5/6) and strong-brown (7.5YR 5/8) fine sandy loam and gray (10YR 6/1) weathered shale; structureless; firm; common fine mica flakes; strongly acid.

The Ap horizon is pale brown, dark grayish brown, or grayish brown.

The B2t horizon is yellowish-red or red silty clay loam, silty clay, or clay mottled with brown and red. Clay content ranges from 35 to 55 percent and silt content from 30 to 50 percent in the upper 20 inches of the B horizon. The B3t horizon is mottled yellowish red, red, or pale brown or is mottled brown and gray. It is silty clay loam, silty clay, or clay. Reaction is strongly acid or very strongly acid.

The C horizon is stratified fine sandy loam, sandy clay loam, loam, and weathered shale and is rich in mica flakes.

Sweatman soils are near Ora and Smithdale soils. They have more clay in the B horizon than Ora and Smithdale soils. They also lack the fragipan of Ora soils.

SwC—Sweatman fine sandy loam, 5 to 12 percent slopes. This well-drained soil is in areas of short, choppy slopes. It has the profile described as representative of the series. Included in mapping are small areas of Ora and Smithdale soils.

Reaction is strongly acid or very strongly acid. Available water capacity is high. Water moves through this soil moderately slowly. Runoff is rapid, and the hazard of erosion is severe where this soil is not protected by permanent vegetation.

This soil should be kept in permanent vegetation to control erosion because of slope.

This soil is well suited to pine trees. Most of the acreage is wooded, but some small areas are in pasture. Capability unit VIe-4; woodland group 3c2.

SXE—Sweatman-Smithdale association, hilly. This association consists of well-drained soils on rough, hilly uplands. Areas cover 300 to 800 acres. Most areas are wooded and consist of long, winding ridges and side slopes that are cut by natural drainageways. Slopes range from 5 to 40 percent.

This unit is more variable than most others in the county. Mapping has been controlled well enough, however, for the anticipated use of the soils.

This association is about 60 percent Sweatman soils, about 30 percent Smithdale soils, and 10 percent well-drained loamy soils high in silt. The pattern and extent of Sweatman and Smithdale soils are fairly uniform throughout the mapped areas. Each area contains the two dominant soils and some contain one or more of the minor soils. A few areas of eroded soils that were once cultivated are included in mapping.

The well-drained Sweatman soils are on the middle and upper slopes and in some places are on the narrow ridgetops. The surface layer is dark grayish-brown fine sandy loam 5 inches thick. The subsoil is red silty clay about 13 inches thick. The next layer is red silty clay loam about 16 inches thick. Below this is stratified fine sandy loam and shale that extends to a depth of 50 inches or more. Reaction is strongly acid or very strongly acid. Available water capacity is high. Water moves through the soil moderately slowly. Runoff is rapid.

The well-drained Smithdale soils are generally on the middle and lower slopes. The surface layer is dark-brown fine sandy loam about 2 inches thick. The subsurface layer is brown sandy loam about 4 inches thick. The subsoil is yellowish-red sandy clay loam that extends to a depth of 20 inches. It is underlain by yellowish-red sandy loam that extends to a depth of 80 inches or more. Reaction is strongly acid or very strongly acid. Available water capacity is medium. Water moves through the soil at a moderate rate.

Most of the association is wooded. This unit is better suited to pine trees and adapted hardwoods than to crops because of slope. Both parts in capability unit VIIe-1. Sweatman part in woodland group 3c2; Smithdale part in woodland group 3o1.

Tippah Series

The Tippah series consists of moderately well drained soils on uplands. These soils formed in loamy material high in silt over clayey material. Slopes are 2 to 5 percent.

In a representative profile the surface layer is dark grayish-brown silt loam about 6 inches thick. The subsoil extends to a depth of 62 inches. The upper 24 inches is silty clay loam that is yellowish red in its upper 16 inches and mottled yellowish red and light brownish gray in the next 8 inches. The lower part of the subsoil is light brownish-gray clay mottled with yellowish red. Below this is weathered shale that extends to a depth of 80 inches or more.

Representative profile of Tippah silt loam, 2 to 5 percent slopes, in a woodland area, 100 feet west of Natchez Trace Parkway, SE¼SW¼ sec. 30, T. 15 S., R. 3 E.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; common fine roots; strongly acid; clear, smooth boundary.

B21t—6 to 14 inches, yellowish-red (5YR 4/6) silty clay loam; moderate, medium, subangular blocky structure; friable; common fine roots; patchy clay films on faces of peds; strongly acid; clear, smooth boundary.

B22t—14 to 22 inches, yellowish-red (5YR 4/6) silty clay loam; common medium, distinct, pale-brown (10YR 6/3) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; continuous clay films on faces of peds; few fine and common brown concretions; strongly acid; clear, smooth boundary.

B23t—22 to 30 inches, mottled yellowish-red (5YR 5/6) and light brownish-gray (10YR 6/2) silty clay loam; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; continuous clay films on faces of peds; many fine brown and black concretions; strongly acid; clear, smooth boundary.

IIB24t—30 to 41 inches, light brownish-gray (10YR 6/2) clay; common medium, subangular structure; firm, sticky and plastic; thin, continuous clay films on faces of peds; many fine brown and black concretions; strongly acid; clear, smooth boundary.

IIB25t—41 to 62 inches, light brownish-gray (10YR 6/2) clay; common medium, distinct, yellowish-red (5YR 5/8) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; thin, continuous clay films on faces of peds; many fine brown and black concretions; strongly acid; clear, smooth boundary.

IIC—62 to 80 inches, weathered shale.

Black and brown concretions in the soil range from none to many. Reaction is medium acid to very strongly acid, except for the surface layer in areas that have been limed.

The Ap horizon is dark grayish brown, yellowish brown, or light yellowish brown.

The B21t and B22t horizons are yellowish red or strong brown. The B23t horizon has colors similar to the B22t horizon with few to many grayish mottles or is mottled in shades of red, gray, or brown. It is silty clay loam or silt loam that is less than 15 percent sand coarser than very fine sand. Clay content of the Bt horizon ranges from 20 to 35 percent. The IIBt horizon has a red, gray, light brownish-gray or yellowish-brown matrix with grayish mottles or it is mottled in shades of brown and gray. It is silty clay, clay, or silty clay loam.

Tippah soils are near Mayhew and Wilcox soils. Tippah soils are better drained and are not so clayey in the upper 20 inches of the Bt horizon as the Mayhew and Wilcox soils.

ThB—Tippah silt loam, 2 to 5 percent slopes. This moderately well drained soil is on ridgetops. Included in mapping are small areas of Mayhew and Wilcox soils.

Reaction is medium acid to very strongly acid. Available water capacity is high. Water moves through the upper part of the subsoil at a moderate rate, but it moves through the lower part slowly. Runoff is medium, and the hazard of erosion is moderate. Tilth is easy to maintain. This soil can be worked throughout a wide range of moisture content without clodding.

This soil can be cultivated year after year by following good conservation practices. Contour cultivating, stripcropping, terracing, and keeping grass in waterways are needed to help control erosion.

If this soil is adequately fertilized and limed, it is suited to cotton, corn, soybeans, and pasture. It is also suited to adapted hardwoods and pine trees. Most areas are used for woodland. A small acreage is used for pasture or row crops. Capability unit IIe-4; woodland group 3o7.

Tuscumbia Series

The Tuscumbia series consists of poorly drained soils on flood plains. These soils formed in clayey alluvium. Slopes are 0 to 2 percent.

In a representative profile the surface layer is very dark grayish-brown silty clay about 6 inches thick. The subsoil is light brownish-gray clay mottled with yellowish brown that extends to a depth of 60 inches or more.

Representative profile of Tuscumbia silty clay, in an area of Tuscumbia-Leeper association, frequently flooded, in a wooded area 4 miles southwest of West Point, NE¼SE¼ sec. 34, T. 17 S., R. 6 E.

A1—0 to 6 inches, very dark grayish-brown (10YR 3/2) silty clay; moderate, medium, granular structure; friable, sticky and plastic; common fine roots; mildly alkaline; clear, smooth boundary.

B21g—6 to 20 inches, light brownish-gray (10YR 6/2) clay; few fine, distinct, yellowish-brown mottles; moderate, fine, subangular blocky structure; firm, very sticky and very plastic; few fine roots; mildly alkaline; clear, wavy boundary.

B22g—20 to 39 inches, light brownish-gray (10YR 6/2) clay; common medium, distinct, yellowish-brown (10YR 5/8) mottles; moderate, medium, subangular blocky structure; firm, very sticky and very plastic; few fine roots; few slickensides that do not intersect; few fine black concretions; mildly alkaline; clear, wavy boundary.

B23g—39 to 60 inches, light brownish-gray (10YR 6/2) clay; common fine and medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; firm, very sticky and very plastic; few fine roots; few slickensides that do not intersect; few fine black concretions; mildly alkaline.

Reaction of the soil is medium acid through moderately alkaline.

The A horizon is dark gray, dark grayish brown, very dark grayish brown, or brown.

The B horizon is light brownish gray, gray, or dark gray mottled with brown, yellowish brown, and yellowish red. It is silty clay, clay, or silty clay loam. The clay content ranges from 35 to 60 percent.

Tuscumbia soils are near Leeper and Una soils. They are not so well drained as Leeper soils. They are more alkaline throughout the soil than Una soils.

TL—Tuscumbia-Leeper association, frequently flooded. This association consists of poorly drained and somewhat poorly drained soils on flood plains. Areas are 300 to 2,000 acres in size. Most areas are wooded. Shallow streams and sloughs that formed from water trapped in old stream beds meander through the areas. Slopes range from 0 to 2 percent.

This unit is more variable than that of most of the others in the county. Mapping has been controlled well enough, however, for the anticipated use of the soils.

This association is about 43 percent Tuscumbia soils, 42 percent Leeper soils, and 15 percent moderately well drained clayey soils and somewhat poorly drained Belden soils. The pattern and extent of the soils are fairly uniform throughout the mapped areas.

The poorly drained Tuscumbia soils are on low areas. They have the profile described as representative of the

Tuscumbia series. Reaction is medium acid through moderately alkaline. Available water capacity is high. Water moves through the soil very slowly. Runoff is very slow.

The somewhat poorly drained Leeper soils are on the old natural levees. They have a surface layer of very dark grayish-brown silty clay about 7 inches thick. The subsoil is dark grayish-brown clay or silty clay about 32 inches thick. It is underlain by gray clay that extends to a depth of 50 inches or more. Reaction is medium acid through moderately alkaline. Available water capacity is high. Water moves through the soil very slowly.

Most of this association is wooded. Hardwoods and a dense undergrowth of brush, vines, briers, and canes cover the areas. Flooding is a severe hazard, especially in winter and in spring. Low areas remain ponded for long periods. Tuscumbia part in capability unit Vw-1; woodland group 2w6. Leeper part in capability unit IVw-1; woodland group 1w6.

Una Series

The Una series consists of poorly drained soils on flood plains. These soils formed in clayey alluvium. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark grayish-brown clay loam about 5 inches thick. The subsoil, which extends to a depth of 52 inches or more, is light-gray clay mottled with light yellowish brown, yellowish brown, and yellowish red.

Representative profile of Una clay loam, in an area of pasture, 2 miles northeast of Abbott, SE¼NE¼ sec. 11, T. 16 S., R. 5 E.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) clay loam; moderate, medium, granular structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21g—5 to 10 inches, light-gray (10YR 6/1) clay; common medium, distinct, light yellowish-brown (10YR 6/4) mottles; weak, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; few fine black and brown concretions; strongly acid; clear, wavy boundary.

B22g—10 to 20 inches, light-gray (10YR 6/1) clay; common medium, prominent, yellowish-red (5YR 5/6) mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; few fine black and brown concretions; strongly acid; clear, wavy boundary.

B23g—20 to 35 inches, light-gray (10YR 6/1) clay; few fine, distinct, yellowish-brown mottles; moderate, medium, subangular blocky structure; firm, sticky and plastic; few fine roots; few fine black and brown concretions; very strongly acid; clear, wavy boundary.

B24g—35 to 52 inches, light-gray (10YR 6/1) clay, few fine, distinct, yellowish-brown mottles; moderate, medium, subangular structure; firm, sticky and plastic; few slickensides that do not intersect; common fine, brown concretions; very strongly acid.

Reaction throughout is strongly acid or very strongly acid, except for the surface layer in areas that have been limed.

The Ap horizon is very dark gray, dark grayish brown, very dark grayish brown, or pale brown.

The Bg horizon is gray, light gray, or light brownish gray mottled in shades of brown and red. It is silty clay or clay. Clay content in the upper 20 inches of the B horizon ranges from 35 to 60 percent. Black and brown concretions range from few to many.

Una soils are near Belden, Leeper, and Tuscumbia soils. They have more clay and are more acid in the B horizon than Belden soils. They are more acid and more poorly drained than Leeper soils. Una soils are more acid in the B horizon than Tuscumbia soils.

Un—Una clay loam. This poorly drained soil is on flood plains. Slopes are 0 to 2 percent. Included in mapping are small areas of Belden and Leeper soils.

Reaction is strongly acid or very strongly acid. Available water capacity is high. Water moves through the soil very slowly. Runoff is very slow, and the hazard of erosion is slight. Good tilth is difficult to maintain because the soil can be cultivated within only a narrow range of moisture content. This soil shrinks and cracks as it dries. Flooding commonly occurs in winter, early in spring, and occasionally during the growing season.

This soil can be rowcropped each year if good conservation is practiced. Graded rows and surface field ditches are needed to remove excess surface water.

If this soil is adequately drained and fertilized, it is suited to soybeans and pasture. Most of the acreage is cultivated or used for pasture, but a few areas are wooded. Capability unit IIIw-3; woodland group 2w6.

Urbo Series

The Urbo series consists of somewhat poorly drained soils on flood plains. These soils formed in clayey alluvium. Slopes are 0 to 2 percent.

In a representative profile the surface layer is dark grayish-brown silty clay loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. The upper 11 inches is grayish-brown silty clay mottled with dark brown. The middle 16 inches is grayish-brown silty clay mottled with yellowish red. The lower part is grayish-brown silty clay mottled with olive brown.

Representative profile of Urbo silty clay loam in an area used for pasture, 1 mile south of Pheba, SE¼SW¼ sec. 27, T. 20 S., R. 13 E.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silty clay loam; weak, fine, granular structure; friable; many fine roots; few fine brown concretions; strongly acid; abrupt, smooth boundary.

B21g—6 to 17 inches, grayish-brown (10YR 5/2) silty clay; few fine, distinct, dark-brown mottles; weak, fine, angular and subangular blocky structure; firm, sticky and plastic; few fine roots; few fine brown and black concretions; strongly acid; gradual, smooth boundary.

B22g—17 to 33 inches, grayish-brown (2.5Y 5/2) silty clay; common fine, distinct, yellowish-red mottles; weak, fine, angular and subangular blocky structure; firm, sticky and plastic; few fine roots; many fine brown and black concretions; strongly acid; gradual, smooth boundary.

B23g—33 to 60 inches, grayish-brown (2.5Y 5/2) silty clay; common medium, distinct, olive-brown (2.5Y 4/4) mottles; moderate, fine and medium, angular and subangular blocky structure; firm, sticky and plastic; few fine roots; very strongly acid.

Reaction throughout is strongly acid or very strongly acid, except for the surface layer in areas that have been limed.

The Ap horizon is dark grayish brown, grayish brown, or brown.

The B21g and B22g horizons are grayish brown or brown and contain few to many mottles in shades of brown and red. The B horizon is silty clay loam, silty clay, or clay. Clay content between depths of 10 and 40 inches ranges from 35 to 55 percent. The B23g horizon is mottled grayish brown and dark yellowish brown, or has matrix colors of grayish brown or light brownish gray.

Urbo soils are near Belden and Mathiston soils. They have similar drainage to Belden and Mathiston soils but are more clayey in the B horizon.

Ur—Urbo silty clay loam. This somewhat poorly drained soil is on flood plains. Slopes are 0 to 2 percent. Included in mapping are small areas of Belden and Mathiston soils.

Reaction is strongly acid or very strongly acid. Available water capacity is high. Water moves through the soil very slowly. Runoff is slow, and the hazard of erosion is slight

in cultivated areas. Good tilth is difficult to maintain because the soil can be cultivated only within a narrow range of moisture content. Flooding commonly occurs in winter, early in spring, and occasionally during the growing season.

This soil can be rowcropped each year if good conservation is practiced. Surface field ditches and row arrangement are needed to remove excess surface water.

If this soil is adequately drained and fertilized, it is suited to cotton, corn, soybeans, and pasture. Most areas are cultivated or used for pasture. A few are wooded. Capability unit IIw-5; woodland group 1w8.

Wilcox Series

The Wilcox series consists of somewhat poorly drained soils on uplands. These soils formed in clayey material. Slopes are 2 to 17 percent.

In a representative profile the surface layer is dark-brown silt loam about 6 inches thick. The subsoil extends to a depth of 45 inches. The upper 8 inches is silty clay mottled in shades of red, gray, and brown. The lower 31 inches is clay mottled in shades of gray, red, and brown. Below this is light-gray soft shale that extends to a depth of about 50 inches or more.

Representative profile of Wilcox silt loam, 5 to 8 percent slopes, in an area used for crops, 6.5 miles northwest of Pheba, SW¼NW¼ sec. 31, T. 16 S., R. 3 E.

Ap—0 to 6 inches, dark-brown (10YR 4/3) silt loam; weak, fine, granular and weak, fine, subangular blocky structure; friable; many fine roots; strongly acid; abrupt, smooth boundary.

B21t—6 to 14 inches, mottled light brownish-gray (2.5Y 6/2), yellowish-red (5YR 4/6), and yellowish-brown (10YR 5/4) silty clay; moderate, fine and medium, angular and subangular blocky structure; firm, sticky and plastic; few fine roots; clay films or pressure faces on peds; very strongly acid; clear, wavy boundary.

B22t—14 to 27 inches, mottled light brownish-gray (2.5Y 6/2), yellowish-red (5YR 4/6), and yellowish-brown (10YR 5/4) clay; strong, fine and medium, angular blocky structure; firm, sticky and plastic; few fine roots; clay films or pressure faces on peds; very strongly acid; clear, wavy boundary.

B23t—27 to 45 inches, mottled light brownish-gray (2.5Y 6/2) and reddish-brown (5YR 4/4) clay; moderate, fine and medium, angular blocky structure; firm, sticky and plastic; clay films or pressure faces on peds; few slickensides that do not intersect; very strongly acid; clear, wavy boundary.

R—45 to 50 inches, light-gray (5Y 7/2) soft shale.

Reaction is strongly acid through extremely acid, except for the surface layer in areas that have been limed.

The Ap horizon is very dark gray, dark gray, dark grayish brown, dark brown, or grayish brown.

The upper part of the Bt horizon is yellowish red or red and contains few to many mottles in shades of gray or is mottled in shades of red, brown, and gray. The lower part of the Bt horizon is similar in color to the upper part or has a light brownish-gray, gray, or light olive-gray matrix containing few to many mottles in shades of brown and red. The Bt horizon is silty clay, clay, or silty clay loam. Clay content in the upper 20 inches of the B horizon ranges from 38 to 60 percent. Soft shale is between depths of 30 to 50 inches.

Wilcox soils are near Mayhew and Tippah soils. Wilcox soils have more clay in the upper part of the B horizon than Tippah soils. They are better drained and are redder in the upper part of the B horizon than Mayhew soils.

WcB—Wilcox silt loam, 2 to 5 percent slopes. This somewhat poorly drained soil is on ridgetops. Included in mapping are small areas of Mayhew and Tippah soils.

This soil has a surface layer of dark-brown silt loam about 4 inches thick. The subsoil to a depth of about 14 inches is yellowish-red clay mottled with yellowish brown and light brownish gray in the lower 5 inches. Below this, and extending to a depth of about 45 inches, is clay mottled in shades of gray and brown. The underlying material is light-gray soft shale that extends to a depth of about 50 inches or more.

Reaction is strongly acid through extremely acid except for the surface in areas that have been limed. Available water capacity is high. Water moves through this soil very slowly. Runoff is slow to medium, and the hazard of erosion is moderate in cultivated areas. Tilth can be maintained by proper use of crop residue. The soil shrinks and cracks as it dries and swells when wet.

Where cultivated, this soil should be protected from erosion. Good management includes using a suitable cropping system, cultivating on the contour, stripcropping, terracing, and keeping grass in waterways.

If adequately fertilized, these soils are suited to corn, oats, soybeans, and pasture. Most areas of this soil are used for row crops or pasture. The rest is in pine trees. Capability unit IIIe-5; woodland group 3c2.

WcC—Wilcox silt loam, 5 to 8 percent slopes. This somewhat poorly drained soil is on ridgetops and upper side slopes. Included in mapping are small areas of Tippah soils. It has the profile described as representative of the series.

Reaction is strongly acid or extremely acid. Available water capacity is high. Water moves through this soil very slowly. Runoff is medium, and the hazard of erosion is moderate in cultivated areas. Tilth can be maintained through proper use of crop residue. The soil shrinks and cracks as it dries and swells when wet. It can be cultivated within only a narrow range of moisture content.

If this soil is cultivated, it is moderately susceptible to erosion. A suitable cropping system, cultivating on the contour, stripcropping, terracing, and keeping grass in waterways help control erosion.

Oats, soybeans, and pasture are suited to this soil if it is adequately fertilized. Pine trees are also suited. Most of this acreage is used for pasture. Capability unit IVe-1; woodland group 3c2.

WcD—Wilcox silt loam, 8 to 17 percent slopes. This somewhat poorly drained soil is on side slopes.

This soil has a surface layer of dark grayish-brown silt loam about 4 inches thick. The subsoil is clay that extends to a depth of 50 inches. It is yellowish red in the upper 6 inches, mottled in shades of red, brown, and gray in the middle 8 inches, and light brownish gray in the lower 30 inches. Below this is light-gray soft shale.

Reaction is strongly acid or extremely acid. Available water capacity is high. Water moves through this soil very slowly. Runoff is rapid, and the hazard of erosion is severe. A permanent cover of plants is needed to control erosion.

This soil is suited to pine trees and pasture. Slopes and the hazard of erosion make it better suited to trees than to field crops or pasture. This soil is mainly in trees, but some areas have been cleared and are mostly in pasture. Capability unit VIe-4; woodland group 3c3.

Use and Management of the Soils

In this section, the management of crops and pasture is discussed and the system of capability grouping used by

the Soil Conservation Service is explained. Predicted yields of the principal crops are given. Also discussed are the use of soils for woodland and wildlife habitat. Properties and features affecting the engineering uses of soils are enumerated, mainly in tables. Recreational uses of the soils are also described.

Management of Crops and Pasture [2]

The general management principles needed for most soils that are used for crops and pasture in Clay County are those that maintain or increase yields, conserve soil moisture, and control erosion.

Some soils cannot be used continually for crops because of the severity of the erosion hazard. Cropping systems that include sod crops or dense ground cover are needed to protect the surface layer from erosion between periods of cultivation. Such factors as soil texture, degree of slope, and prior erosion determine the duration of clean-tilled row crops and intervals of sod or cover crops.

Most soils in Clay County are medium or low in natural fertility, and plant response to fertilization is generally good. Crop residue that is shredded and left on the surface helps to reduce erosion, increase infiltration of water, and maintain organic-matter content.

Sloping soils on uplands need terracing or stripcropping and contouring in many places to reduce runoff and erosion. Kipling silt loam, 5 to 8 percent slopes, eroded, is such a soil. Runoff from terraces or rows should be discharged into vegetated or grassed waterways. Natural watercourses generally make the best waterways.

Soils on flood plains are subject to periodic flooding in many places. These soils generally require artificial drainage measures, such as main and lateral ditches or surface field ditches, to remove excess surface water. Belden silt loam is such a soil. Diversions are effective in protecting these soils from excess runoff from adjacent areas on uplands.

The soils in Clay County are suited to many pasture plants. Timely and adequate applications of fertilizer increase forage production and the carrying capacity of pastures. Regulation of grazing is essential for adequate soil cover and sustained plant growth. Weeds and brush should be controlled by mowing or use of approved herbicides.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The groups are made according to the limitations of the soils when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering.

In the capability system, all kinds of soils are grouped at three levels: the capability class, subclass, and unit. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w, s,* and *c,* because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-1. Thus, in one symbol, the Roman numeral designates the capability class, or degree or limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

A list of the capability classes, subclasses, and units in Clay County are as follows:

Class I. Soils that have few limitations that restrict their use.
- Unit I-1. Nearly level, well-drained soils that have a loamy subsoil; on stream terraces.

Class II. Soils that have moderate limitations that reduce the choice of plants or that require moderate conservation practices.
- Subclass IIe. Soils that are subject to moderate erosion if they are not protected.
  - Unit IIe-1. Gently sloping, somewhat poorly drained soils that have a clayey subsoil; on uplands.
  - Unit IIe-2. Gently sloping, well-drained soils that have a clayey subsoil; on uplands.
  - Unit IIe-3. Gently sloping, somewhat poorly drained soils that have a loamy subsoil high in silt; on uplands.

[2] WILLIAM M. LIPE, conservation agronomist, Soil Conservation Service, helped prepare this section.

Unit IIe-4. Gently sloping, moderately well drained soils that have a loamy subsoil high in silt; on uplands.

Unit IIe-5. Gently sloping, moderately well drained soils that have a loamy subsoil over a fragipan; on uplands.

Subclass IIw. Soils that have moderate limitations because of excess water.

Unit IIw-1. Nearly level, somewhat poorly drained, nonacid soils that have a clayey subsoil; on flood plains.

Unit IIw-2. Nearly level, moderately well drained soils that have a loamy subsoil over a fragipan; on uplands.

Unit IIw-3. Nearly level, somewhat poorly drained soils that have a loamy subsoil high in silt; on uplands.

Unit IIw-4. Nearly level, somewhat poorly drained soils that have a clayey subsoil; on uplands.

Unit IIw-5. Nearly level, moderately well drained and somewhat poorly drained soils that have a clayey subsoil; on flood plains.

Unit IIw-6. Nearly level, somewhat poorly drained soils that have a loamy subsoil high in silt; on flood plains.

Subclass IIs. Soils that have moderate limitations because of moisture capacity or tilth.

Unit IIs-1. Nearly level, well-drained soils that have a clayey surface layer and subsoil; on uplands.

Class III. Soils that have severe limitations that reduce the choice of plants, that require special conservation practices, or both.

Subclass IIIe. Soils that are subject to severe erosion if they are not protected.

Unit IIIe-1. Sloping, well-drained soils that have a loamy subsoil; on uplands.

Unit IIIe-2. Gently sloping, well-drained soils that have a clayey surface layer and subsoil; on uplands.

Unit IIIe-3. Gently sloping, somewhat poorly drained soils that have a clayey subsoil; on uplands.

Unit IIIe-4. Sloping, moderately well drained soils that have a loamy subsoil over a fragipan; on uplands.

Unit IIIe-5. Gently sloping, somewhat poorly drained soils that have a clayey subsoil; on uplands.

Subclass IIIw. Soils that have severe limitations because of excess water.

Unit IIIw-1. Nearly level, poorly drained soils that have a clayey subsoil; on uplands.

Unit IIIw-2. Nearly level, poorly drained soils that have a loamy subsoil; on uplands.

Unit IIIw-3. Nearly level, poorly drained soils that have a clayey subsoil; on flood plains.

Subclass IIIs. Soils that have severe limitations caused by droughtiness.

Unit IIIs-1. Nearly level, excessively drained sandy soils on stream terraces.

Class IV. Soils that have very severe limitations that reduce the choice of plants, that require very careful management, or both.

Subclass IVe. Soils that are subject to very severe erosion if they are not protected.

Unit IVe-1. Sloping, somewhat poorly drained soils that have a clayey subsoil; on uplands.

Unit IVe-2. Strongly sloping, moderately well drained soils that have a loamy subsoil over a fragipan; on uplands.

Subclass IVw. Soils that have very severe limitations because of excess water.

Unit IVw-1. Nearly level, somewhat poorly drained, nonacid soils that have a clayey subsoil and that are frequently flooded; on flood plains.

Unit IVw-2. Nearly level, poorly drained soils that have a clayey subsoil; on uplands.

Class V. Soils that are not likely to erode but that have other limitations, impractical to remove, that limit their use largely to pasture, woodland, or wildlife.

Subclass Vw. Soils that are too wet for cultivation and that cannot be feasibly drained or protected.

Unit Vw-1. Nearly level, poorly drained, nonacid soils that have a clayey subsoil and are frequently flooded; on flood plains.

Class VI. Soils that have severe limitations that make them generally unsuited to cultivation and that limit their use largely to pasture, range, woodland, or wildlife habitat.

Subclass VIe. Soils that are subject to sever limitations because of erosion.

Unit VIe-1. Gently sloping, well-drained soils that have a clayey subsoil shallow over chalk; on uplands.

Unit VIe-2. Chalk outcrop and sloping to rolling, well-drained soils that have a clayey subsoil shallow over chalk; on uplands.

Unit VIe-3. Sloping to rolling, well-drained calcareous soils that have a clayey subsoil; on uplands.

Unit VIe-4. Sloping to rolling, well-drained and somewhat poorly drained soils that have a clayey subsoil; on uplands.

Class VII. Soils that have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture, range, woodland, or wildlife habitat.

Subclass VIIe. Soils that are subject to severe limitations because of erosion.

Unit VIIe-1. Hilly, well-drained soils that have a loamy and clayey subsoil; on uplands.

Class VIII. Soils and landforms that have limitations that preclude thieir use for commercial plants and that restrict their use to recreation, wildlife, water supply, and to esthetic purposes. (None in Clay County.)

The soils in Clay County have been placed in 33 capability units. The soils in each unit have about the same limitations, are subject to similar risks of damage, need about the same kind of management, and respond to management in about the same way. Their management is discussed in the descriptions of the mapping units in the section "Descriptions of the Soils." To determine the names of the soils in a

capability unit, refer to the "Guide to Mapping Units" at the back of this survey.

Predicted yields

Table 2 lists predicted yields of the principal crops grown in the county. The predictions are based on estimates made by farmers, soil scientists, and others who have knowledge of yields in the county and on information taken from research data. The predicted yields are average yields per acre that can be expected by good commercial farmers at the level of management which tends to produce the highest economic returns.

The yields are given for both dryland and irrigated soils if the soils are used for both methods of farming. If only one method is practical, yields for only this method of farming are given. Not included in this table are soils that are used only as range or for recreation.

Crops other than those shown in table 2 are grown in the county, but their predicted yields are not included because their acreage is small or reliable data on yields are not available.

The predicted yields given in table 2 can be expected if the following management practices are used:

On dryland soils:

1. Rainfall is effectively used and conserved.
2. Surface or subsurface drainage systems are installed.
3. Crop residues are managed to maintain soil tilth.
4. Minimum but timely tillage is used.
5. Insect, disease, and weed control measures are consistently used.
6. Fertilizer is applied according to soil test and crop needs.
7. Adapted crop varieties are used at recommended seeding rates.

On irrigated soils, the following additional practices are used:

8. Suitable quality irrigation water is used.
9. Irrigations are timed to meet the need of the soil and crop.
10. Irrigation systems are properly designed and efficiently used.

Use of the Soils for Woodland [3]

This section contains information that can be used by woodland owners and managers, foresters, and farmers in developing and carrying out plans for profitable tree farming.

An area of approximately 112,000 acres, or 42 percent of the total land area of 264,960 acres in Clay County, was classified as commercial forest as of 1967 (*16*). This forest land was further subdivided by the following ownership classes:

	Acres
Miscellaneous private	49,600
Farmer-owned	38,900
Forest industry	22,200
Other public	1,300

[3] JOSEPH V. ZARY, forester, helped prepare this section.

Forest Survey records for Mississippi indicate that there has been a reduction in acreage of commercial forest land from 121,000 acres in 1957 to 112,000 acres in 1967 and 101,000 acres in 1972 (*13, 16, 23*). This reduction was the result of conversion of forest land to other land uses, such as cropland and pasture land. These conversions occurred mainly in the more fertile bottom land hardwood areas.

To facilitate management, the present commercial forest land may be subdivided into forest types. A forest type is made up of trees with similar characteristics growing under the same ecological and biological conditions. A forest type is named for the dominant tree species in it. For poletimber sized trees—5 to 9 inches in diameter at breast height for softwoods and 5 to 11 inches for hardwoods—and larger trees, stocking is determined from basal area occurrence. For trees less than 5 inches in diameter at breast height, stocking is determined from numbers of trees (*13, 15, 16*).

In Clay County the oak-gum-cypress forest type occupies the largest area, 50,400 acres (*17*). This is a bottom land forest type in which 50 percent or more of the stand is tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or combined. Other common trees include cottonwood, willow, ash, elm, hackberry, and maple. Most of this acreage occurs on the bottom land of the Tombigbee River; the Town Creek system with its tributaries: Fuller, Spring, and Dry Creeks; and the Tibbee Creek system with its tributaries: Chuquatonchee, Houlka, Line, Spring, and Catalpa Creeks. Much of this bottom land forest has been high-graded for the best trees and most valuable species. The rest of the second-growth forest contains a high percentage of culls and inferior trees and second-rate species. Continued conversion of these bottoms to crops and pasture is anticipated so the acreage occupied by the oak-gum-cypress forest type will be further reduced.

The oak-hickory forest type occupies about 33,600 acres of Clay County. This type includes forests in which 50 percent or more of the stand is upland oaks or hickory, singly or combined. Other common trees include yellow-poplar, elm, and maple. A large part of this acreage occurs in the hilly lands of the western third of the county.

The loblolly-shortleaf pine forest type occupies approximately 28,000 acres in Clay County. This type consists of forests in which 50 percent or more of the stand is loblolly or shortleaf pine, singly or combined. Other common trees include oak, hickory, and gum. This forest type occurs mainly on middle and upper slopes of the hilly woodlands in the western third of the county. Here it is intermingled with the oak-hickory forest type.

From 1955 to 1973, close to 11 million tree seedlings, mainly loblolly pine, were planted in Clay County. Also planted were small quantities of slash pine and hardwood seedlings. From 1957 to 1969, the peak in tree planting was reached and coincided with the Soil Bank Program. These plantations represent some 1,100 acres, most of which are in forest industry ownership in the western part of the county.

In 1972, Clay County produced 5,974,000 board feet of sawlogs, including 4,808,000 board feet of hardwoods and 1,166,000 board feet of softwoods, mainly pine. During the same year the county produced 7,437 standard cords of pulpwood, including 5,019 cords of softwoods, mainly pine, and 2,418 cords of hardwoods. In 1972, very small volumes

TABLE 2.—*Estimated yields per acre of crops and pasture plants*

[Absence of data indicates that the crop is not generally grown]

Soil	Cotton (lint)	Corn	Soybeans	Oats	Common bermudagrass and legumes	Bahiagrass and legumes	Fescue and legumes	Improved bermudagrass
	Lbs	*Bu*	*Bu*	*Bu*	*AUM* [1]	*AUM* [1]	*AUM* [1]	*AUM* [1]
Belden silt loam	650	80	35		7.0		11.0	
Bigbee loamy sand		55			7.5	7.5		8.0
Binnsville silty clay loam, 2 to 6 percent slopes					4.0			
Brooksville silty clay, 0 to 1 percent slopes	675	60	35	80	8.0		9.0	11.0
Brooksville silty clay, 1 to 3 percent slopes	625	55	30	70	8.0		8.5	10.5
Cahaba sandy loam, 0 to 2 percent slopes	750	90	35	75	8.5	9.5	9.5	10.0
Chalk outcrop-Demopolis complex, 5 to 15 percent slopes					4.0			
Griffith silty clay	750	85	40	80	8.0		11.0	
Kipling silt loam, 0 to 2 percent slopes	550	50	30	55	6.0	7.0	7.0	8.5
Kipling silt loam, 2 to 5 percent slopes, eroded	550	50	25	55	5.5	7.0	6.5	8.5
Kipling silt loam, 5 to 8 percent slopes, eroded	500	45	20	45	5.0	6.0	5.5	7.5
Leeper silty clay loam	750	80	40		8.0		11.0	12.0
Longview silt loam, 0 to 2 percent slopes	650	85	30		8.0	7.0	8.0	9.0
Longview silt loam, 2 to 5 percent slopes	650	80	30		8.0	7.0	8.0	9.0
Mathiston silt loam	700	95	35		7.0	10.0	10.0	11.0
Mayhew silt loam, 0 to 2 percent slopes [2]			30	50	6.5	8.0	8.0	
Okolona silty clay, 0 to 1 percent slopes	700	60	35	80	8.5		9.0	11.0
Okolona silty clay, 1 to 3 percent slopes	650	60	35	70	8.5		9.0	10.5
Ora loam, 2 to 5 percent slopes	700	80	35	60	7.0	9.0	8.0	8.5
Ora loam, 5 to 8 percent slopes, eroded	600	70	30	60	7.0	8.5	7.5	8.0
Ora loam, 8 to 12 percent slopes, eroded					5.0	8.0	7.0	7.0
Ozan sandy loam			20		6.0	7.0	7.0	
Prentiss sandy loam, 0 to 2 percent slopes	750	85	30	70	7.0	9.0	8.0	9.0
Prentiss sandy loam, 2 to 5 percent slopes	750	80	30	70	7.0	9.0	8.0	9.0
Ruston fine sandy loam, 5 to 8 percent slopes	600	70	30	60	7.5	10.0	8.5	10.0
Sessum silty clay			25		6.0	7.0	6.0	9.0
Smithdale-Ruston association, hilly								
Stough sandy loam, 0 to 2 percent slopes	725	80	25	50	7.0	8.0	8.0	8.0
Sumter silty clay, 2 to 5 percent slopes, eroded			25	70	6.0		7.0	
Sumter silty clay, 5 to 12 percent slopes, eroded				60	5.0		6.5	
Sweatman fine sandy loam, 5 to 12 percent slopes					4.0	6.0		
Sweatman-Smithdale association, hilly								
Tippah silt loam, 2 to 5 percent slopes	650	80	35		6.0	9.0	8.5	10.0
Tuscumbia-Leeper association, frequently flooded					4.5		5.5	
Una clay loam			25		7.5		9.0	
Urbo silty clay loam	700	95	35		8.0		11.0	12.0
Wilcox silt loam, 2 to 5 percent slopes		40	25	35	6.5	8.0	7.5	
Wilcox silt loam, 5 to 8 percent slopes			20	30	6.0	7.0	7.0	
Wilcox silt loam, 8 to 17 percent slopes					5.0	5.5	5.5	

[1] AUM means animal-unit-months. The amount of forage or feed required to maintain one animal unit (1 cow, steer, or horse; 5 hogs; or 7 sheep) or 1 acre for 30 days without damaging the pasture.

[2] Mayhew silt loam, 0 to 2 percent slopes, are well suited to sweet potatoes and produce about 225 bushels per acre.

of veneer logs, poles, piling, and fence posts were produced. These volumes were considered negligible and were not included in timber production statistics for these products (*20, 22*).

Plant byproducts utilized during 1972 totaled 853,000 cubic feet, including 533,000 cubic feet of coarse byproducts, mainly pulp chips, and 320,000 cubic feet of fine byproducts, such as sawdust and shavings. Of these byproducts, 678,000 cubic feet were derived from hardwoods and 175,000 cubic feet were derived from softwoods, practically all pine (*19*). Recovery of these residues indicates that wood-using plants are practicing more intensive utilization than heretofore, and that wood waste is being reduced to a minimum.

In 1972, there were three main wood-using plants operating in the county. These included one large sawmill that had an annual output of more than 3 million board feet, one small sawmill that had an annual output of less than 3 million board feet, and one hardwood dimension mill that processed furniture stock (*22*). All three plants were located in West Point.

During 1972, 4 to 6 major pulp and paper mills procured pine pulpwood and 1 to 3 mills procured hardwood pulpwood in Clay County (*20*).

Woodland suitability groups

Originally, Clay County was mainly wooded. Now trees cover about 38 percent of the county (*16*).

Good stands of commercial trees are produced in the woodlands of the county. Needleleaf forest types are most common on the hills, and broadleaf types generally predominate on the bottoms along the rivers and creeks.

The value of the wood products is substantial, though it is below its potential. Other values include grazing, wildlife, recreation, natural beauty, and conservation of soil and water. This section has been provided to explain how soils affect tree growth and management in the county. In table 3 potential productivity and management problems of the soils in Clay County are listed.

In the first column the soils are listed by their mapping unit symbols under the series name to which they belong. If soils of two series are in a mapping unit, as in a complex or an association, the component soils are listed and evaluated separately under each series name.

The next column gives the woodland suitability group (*6, 7*). Each group is made up of soils that are suited to the same kinds of trees, that need about the same kind of management to produce these trees, and that have about the same potential productivity.

Each woodland ordination group is identified by a 3-part symbol. The first part of the symbol indicates the relative productivity of the soils: 1 is very high, 2 is high, 3 is moderately high, 4 is moderate, and 5 is low. The second part of the symbol, a letter, indicates the important soil property that imposes a moderate to severe hazard or limitation in managing the soils for wood production. The letter *x* shows that the main limitation is stoniness or rockiness; *w* shows that excessive water in or on the soil is the chief limitation; *t* shows that toxic substances in the soil are the chief limitation; *d* shows that the rooting depth is restricted; *c* shows that clay in the upper part of the soil is a limitation; *s* shows the soils are sandy; *f* shows that the soils have large amounts of coarse fragments; *r* shows the soils have steep slopes; and *o* shows the soils have no significant restrictions or limitations for woodland use or management. The third element in the symbol indicates the degree of management problems and the general suitability of the soils for certain kinds of trees.

The management concerns evaluated are erosion hazard, equipment limitation, and seedling mortality. Erosion hazard measures the risk of soil losses in well-managed woodland. Erosion hazard is *slight* if expected soil loss is small, *moderate* if some measures to control erosion are needed in logging and construction, and *severe* if intensive treatment or special equipment and methods are needed to prevent excessive soil losses.

Equipment limitation ratings reflect the soil conditions that restrict the use of equipment normally used in woodland management or harvesting. A *slight* rating indicates equipment use is not limited to kind or time of year. *Moderate* indicates a seasonal limitation or need for modification in methods or equipment. *Severe* indicates the need for specialized equipment or operations.

Seedling mortality ratings indicate the degree of expected mortality of planted seedlings when plant competition is not a limiting factor. Normal rainfall, good planting stock, and proper planting are assumed. A *slight* rating indicates expected mortality is less than 25 percent. *Moderate* indicates a 25 to 50 percent loss; and *severe* indicates over 50 percent loss of seedling.

In the potential productivity column is a list of some of the commercially important trees which are adapted to the soil. These are the trees which woodland managers will generally favor in intermediate or improvement cuttings. Also given is the potential productivity of these trees in terms of site index. The site index is the average height of dominant trees, in feet, at age 30 for cottonwood; at age 35 for sycamore; at age 25 for planted pines; and at age 50 for all other species or types.

In the last column is a list of trees suitable to plant for commercial wood production.

Use of the Soils for Wildlife [4]

Soils directly influence the kinds and amounts of vegetation and the amount of water available in an area, and, in this way, indirectly influence the kinds of wildlife that can live in the area. Soil properties that affect the growth of wildlife habitat are the thickness of the soil useful to crops, the texture of the surface layer, the available water capacity to a depth of 40 inches, the wetness, the stoniness or rockiness of the surface, the hazard of flooding, the slope, and the permeability of the soil to air and water.

In table 4 the soils of this survey area are rated according to their ability to support kinds of wildlife. Each soil is also rated according to its suitability for producing various kinds of plants and other elements that make up wildlife habitat. The ratings take into account mainly the characteristics of the soils and the closely related natural factors of the environment. They do not take into account climate, present use of the soils, or present distribution of wildlife and people. For this reason, selection of a site for development as habitat for wildlife requires inspection of the site.

[4] E. G. SULLIVAN, biologist, helped prepare this section.

TABLE 3.—*Woodland management and productivity*

Soil series and map symbols	Suitability group	Management concerns			Potential productivity		Trees to plant
		Hazard of erosion	Equipment limitation	Seedling mortality	Important trees	Site index	
Belden: Be	1w8	Slight	Moderate	Moderate	Eastern cottonwood Southern red oak White oak Loblolly pine Sweetgum Yellow-poplar	110 100 90 100 100 95	Eastern cottonwood, loblolly pine, sweetgum, American sycamore, yellow-poplar, green ash.
Bigbee: Bg	2s2	Slight	Moderate	Moderate	Loblolly pine	88	Loblolly pine.
Binnsville: BnB	4d3c	Slight	Moderate	Severe	Eastern redcedar	40	Eastern redcedar.
Brooksville: BrA, BrB	4c2c	Slight	Moderate	Moderate	Eastern redcedar	40	Eastern redcedar.
Cahaba: CaA	2o7	Slight	Slight	Slight	Loblolly pine Slash pine Yellow-poplar Sweetgum Southern red oak White oak Cherrybark oak	90 90 90 85 80 80 90	Loblolly pine, slash pine, yellow-poplar, cherrybark oak.
Chalk outcrop-Demopolis complex: CoD. Too variable to be rated.							
Griffith: Gr	1w6	Slight	Severe	Severe	Eastern cottonwood Green ash Sweetgum American sycamore	110 95 95 100	Eastern cottonwood, green ash, sweetgum, American sycamore.
Kipling: KpA, KpB2, KpC2	2c8	Slight	Moderate	Moderate	Cherrybark oak Loblolly pine Shumard oak Sweetgum Water oak White oak	90 90 85 90 80 80	Cherrybark oak, loblolly pine, Shumard oak, sweetgum.
Leeper: Le	1w6	Slight	Severe	Severe	Eastern cottonwood Sweetgum Green ash American sycamore	110 95 90 100	Eastern cottonwood, sweetgum, green ash, American sycamore.
Longview: LoA, LoB	2w8	Slight	Moderate	Slight	Cherrybark oak Water oak Loblolly pine Sweetgum	88 82 86 88	Cherrybark oak, shumard oak, loblolly pine, sweetgum, yellow-poplar.
Mathiston: Ma	1w8	Slight	Moderate	Slight	Cherrybark oak Green ash Loblolly pine Sweetgum	100 90 95 95	Cherrybark oak, green ash, loblolly pine, sweetgum, American sycamore.
Mayhew: MhA	2w9	Slight	Severe	Slight	Water oak Loblolly pine Sweetgum	80 90 90	Loblolly pine, slash pine, sweetgum.
Okolona: OkA, OkB	4c2c	Slight	Moderate	Moderate	Eastern redcedar	40	Eastern redcedar.
Ora: OrB, OrC2, OrD2	3o7	Slight	Slight	Slight	Loblolly pine Shortleaf pine Sweetgum	83 69 80	Loblolly pine, slash pine.
Ozan: Oz	2w9	Slight	Severe	Severe	Loblolly pine Sweetgum Water oak	95 90 90	Loblolly pine, shumard oak, sweetgum, American sycamore, eastern cottonwood.
Prentiss: PrA, PrB	2o7	Slight	Slight	Slight	Loblolly pine Shortleaf pine Sweetgum Cherrybark oak White oak	88 79 90 90 80	Loblolly pine, slash pine.
Ruston: RuC	3o1	Slight	Slight	Slight	Loblolly pine Shortleaf pine	85 75	Loblolly pine.
Sessum: Se	3c8	Slight	Moderate	Moderate	Loblolly pine Sweetgum Eastern redcedar	83 80 45	Eastern redcedar, loblolly pine.

TABLE 3.—*Woodland management and productivity*—Continued

Soil series and map symbols	Suitability group	Management concerns			Potential productivity		Trees to plant
		Hazard of erosion	Equipment limitation	Seedling mortality	Important trees	Site index	
Smithdale: SRE.							
Smithdale part	3o1	Slight	Slight	Slight	Loblolly pine Shortleaf pine	80 69	Loblolly pine.
Ruston part	3o1	Slight	Slight	Slight	Loblolly pine Shortleaf pine	85 75	Loblolly pine.
Stough: StA	2w8	Slight	Moderate	Slight	Cherrybark oak Loblolly pine Slash pine Sweetgum Water oak	85 90 86 85 80	Loblolly pine, slash pine, sweetgum.
Sumter: SuB2, SuC2	4c2c	Moderate	Moderate	Moderate	Eastern redcedar	40	Eastern redcedar.
Sweatman:							
SwC	3c2	Slight	Moderate	Slight	Loblolly pine Shortleaf pine	83 73	Loblolly pine, shortleaf pine.
SXE:							
Sweatman part	3c2	Slight	Moderate	Slight	Loblolly pine Shortleaf pine	83 73	Loblolly pine, shortleaf pine.
Smithdale part	3o1	Slight	Slight	Slight	Loblolly pine Shortleaf pine	80 69	Loblolly pine.
Tippah: ThB	3o7	Slight	Slight	Slight	Cherrybark oak Shumard oak White oak Loblolly pine Sweetgum Yellow-poplar	95 95 80 78 90 90	Cherrybark oak, shumard oak, loblolly pine, sweetgum, yellow-poplar.
Tuscumbia: TL.							
Tuscumbia part	2w6	Slight	Severe	Severe	Eastern cottonwood Green ash Sweetgum	100 95 85	Eastern cottonwood, green ash, sweetgum.
Leeper part	1w6	Slight	Severe	Severe	Eastern cottonwood Sweetgum Green ash American sycamore	110 95 90 100	Eastern cottonwood, sweetgum, green ash, American sycamore.
Una: Un	2w6	Slight	Moderate	Severe	Sweetgum Eastern cottonwood Green ash Cherrybark oak Nuttall oak Water oak Willow oak Water tupelo	90 85 75 90 95 90 90 80	Sweetgum, green ash, nuttall oak, water tupelo.
Urbo: Ur	1w8	Slight	Moderate	Slight	Green ash Eastern cottonwood Cherrybark oak Sweetgum	93 108 99 98	Eastern cottonwood, loblolly pine, sweetgum, American sycamore, yellow-poplar.
Wilcox:							
WcB, WcC	3c2	Slight	Moderate	Moderate	Loblolly pine Shortleaf pine Slash pine	81 68 85	Loblolly pine.
WcD	3c3	Severe	Moderate	Moderate	Loblolly pine Shortleaf pine Slash pine	81 68 85	Loblolly pine.

A rating of *good* means that the element of wildlife habitat or the kind of wildlife is easily created, improved, and maintained. Few or no limitations affect management in this category, and satisfactory results can be expected if the soil is used for the prescribed purpose.

A rating of *fair* means the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderate intensity of management and fairly frequent attention are required for satisfactory results.

A rating of *poor* means the limitations for the designated element of wildlife habitat or kind of habitat are severe. Habitat can be created, improved, or maintained, but management is difficult and requires intensive effort.

A rating of *very poor* means that restrictions on the use of the soil for the element of wildlife habitat or kind of wildlife are very severe and that unsatisfactory results can be expected. It is either impossible or impractical to create, improve, or maintain wildlife habitat.

TABLE 4.—*Soil ratings for wildlife habitat*

Soil series and map symbols	Elements of wildlife habitat						Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Wetland plants	Shallow-water areas	Openland	Woodland	Wetland
Belden: Be	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Bigbee: Bg	Poor	Fair	Fair	Poor	Very poor	Very poor	Fair	Poor	Very poor.
Binnsville: BnB	Poor	Poor	Fair	Fair	Poor	Very poor	Poor	Fair	Very poor.
Brooksville: BrA, BrB	Fair	Good	Fair	Poor	Fair	Fair	Fair	Good	Fair.
Cahaba: CaA	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
Chalk outcrop: CoD.									
Chalk outcrop part	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor	Very poor.
Demopolis part	Poor	Poor	Poor	Poor	Very poor	Very poor	Poor	Poor	Very poor.
Griffith: Gr	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Kipling:									
KpA	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
KpB2	Fair	Good	Good	Good	Poor	Fair	Good	Good	Poor.
KpC2	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Leeper: Le	Good	Good	Fair	Good	Fair	Good	Good	Good	Fair.
Longview:									
LoA	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
LoB	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
Mathiston: Ma	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Mayhew: MhA	Poor	Fair	Good	Fair	Fair	Fair	Fair	Fair	Fair.
Okolona: OkA, OkB	Good	Good	Fair	Poor	Poor	Very poor	Good	Good	Very poor.
Ora:									
OrB	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
OrC2, OrD2	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Ozan: Oz	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Prentiss: PrA, PrB	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ruston: RuC	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Sessum: Se	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Smithdale: SRE.									
Smithdale part	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Ruston part	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor.
Stough: StA	Fair	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Sumter:									
SuB2	Fair	Fair	Fair	Good	Poor	Very poor	Fair	Good	Very poor.
SuC2	Fair	Fair	Fair	Good	Very poor	Very poor	Fair	Good	Very poor.
Sweatman:									
SwC	Fair	Good	Good	Good	Poor	Very poor	Good	Good	Very poor.
SXE:									
Sweatman part	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Smithdale part	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.
Tippah: ThB	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Tuscumbia: TL.									
Tuscumbia part	Poor	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Leeper part	Good	Good	Fair	Good	Fair	Good	Good	Good	Fair.
Una: Un	Poor	Fair	Good	Fair	Good	Good	Fair	Fair	Good.
Urbo: Ur	Fair	Good	Fair	Good	Good	Good	Fair	Good	Good.
Wilcox:									
WcB	Fair	Good	Good	Good	Fair	Poor	Good	Good	Poor.
WcC, WcD	Poor	Fair	Good	Good	Very poor	Very poor	Fair	Good	Very poor.

Each habitat element rated in table 4 is explained as follows.

Grain and seed crops.—Seed-producing annual plants used by wildlife. Examples are wheat, corn, oats, and soybeans.

Grasses and legumes.—Domestic grasses and legumes that are established by planting and provide food and cover for wildlife. Grasses include bahiagrass, ryegrass, and fescue; legumes include bicolor lespedeza, clovers, and partridgepea.

Wild herbaceous plants.—Native or introduced perennial grasses, forbs, and weeds generally established naturally. They provide food and cover for wildlife. Examples are pokeweed, ragweed, woolly croton, elderberry, and sumac.

Hardwood trees.—Nonconiferous trees, shrubs, and woody vines that produce food for wildlife in the form of fruits, nuts, buds, catkins, and browse. Such plants commonly grow in a natural environment, but they are also planted and developed through wildlife management programs. Typical species in this category are oaks, hickory, beech, mulberry, grape, and honeysuckle.

Wetland plants.—Annual and perennial herbaceous plants that grow wild on moist and wet soils. They furnish food and cover mostly for wetland wildlife. Typical examples of these plants are smartweed, barnyardgrass, and rushes. Submerged and floating aquatic plants are not included in this category.

Shallow-water areas.—Impoundments or excavations for controlling water, generally not more than 5 feet deep, to create habitats that are suitable for waterfowl. Some areas are designed to be drained, planted, and then flooded; others are permanent impoundments that grow submerged aquatic plants.

Table 4 also rates soils according to their potential as habitat for the three kinds of wildlife—openland, woodland, and wetland. These ratings are based on the ratings made for the applicable elements of habitat. For example, soils rated very poor for shallow-water developments are rated very poor for wetland wildlife.

Openland wildlife.—Birds and mammals that normally live in meadows, pastures, lawns, and open areas where grasses, herbs, and shrubby plants grow. Quail, dove, cottontail rabbit, and fox are typical examples of openland wildlife.

Woodland wildlife.—Birds and mammals that normally live in wooded areas consisting of hardwood trees, coniferous trees, and shrubs. Woodcock, wild turkey, deer, squirrel, and raccoon are typical examples of woodland wildlife.

Wetland wildlife.—Birds and mammals that normally live in wet areas, marshes, and swamps. Duck, geese, heron, mink, and muskrat are typical examples of wetland wildlife.

Engineering Uses of the Soils [5]

This section is useful to those who need information about soils used as structural material or as foundations upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and reaction. Also important are depth to the water table, depth to bedrock, and slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternative routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 5 through 11, which show several estimated soil properties significant in engineering and interpretations for various engineering uses.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 8, 9, 10, and 11. It can also be used to make other useful maps.

The information in this section does not eliminate the need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 72 inches. Also, inspection of sites, especially small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have special meaning in soil science but are not known to all engineers. Many of these terms commonly used in soil science are defined in the Glossary.

Engineering classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system (*21*) used by the engineers of the Soil Conservation Service, Department of Defense, and others; and the AASHTO system (*1*) adopted by the American Association of State Highway and Transportation Officials.

[5] V. L. BYRD, agricultural engineer, helped prepare this section.

In the Unified system, soils are classified according to particle-size distribution, plasticity, liquid limit, and content of organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, SP-SM.

The AASHTO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system a soil is placed in one of seven basic groups, ranging from A-1 to A-7, on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A-7, are clayey soils that have low strength when wet and that are the poorest soils for subgrade.

Estimated soil properties significant in engineering

Several estimated soil properties significant in engineering are given in tables 5, 6, and 7. These estimates are made for the representative profiles of each kind of soil. Estimates are given for the whole soil or for layers sufficiently different to have significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other survey areas. Following are explanations of some of the columns in table 5.

Soil texture is described in table 5 in the standard terms used by the U.S. Department of Agriculture. These terms take into account the percentage of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the glossary.

Unified and AASHTO estimated ratings are also given. For an explanation of these terms see the section "Engineering Classification Systems." The columns headed "Percentage passing sieve number" show estimated particle-size distribution according to standard sieve sizes.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic state; and the liquid limit, from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic. "NP" in the table indicates the soil material is nonplastic.

Table 6 contains information on the estimated physical and chemical properties of the soil. Following are explanations of some of the terms used in that table.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on the basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 6 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants. Available water capacity is influenced greatly by soil texture, density, and content of salts, and the content of organic matter.

Soil reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. The pH values and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is the change in the volume of soil material when the content of moisture changes. It is the extent to which the soil shrinks as it dries or swells as it gets wet. This shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils cause much damage to building foundations, roads, and other structures. A *high* shrink-swell potential indicates a hazard to maintenance of structures built in, on, or with material having this rating.

Risk of corrosion, as used in table 6, pertains to potential soil-induced chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to soil properties such as drainage, texture, total acidity, and electrical conductivity of the soil material. Corrosivity for concrete is influenced mainly by the content of sodium or magnesium sulfate, but also by soil texture and acidity. Installations of uncoated steel that intersect soil boundaries or soil horizons are more susceptible to corrosion than installations entirely in one kind of soil or in one soil horizon. A corrosivity rating of *low* means there is a low probability of soil-induced corrosion damage. A rating of *high* means that there is a high probability of damage, so that protective measures for steel and more resistant concrete should be used to avoid or minimize damage.

Erosion factors are used in an equation that predicts the amount of erosion resulting from certain land treatment. The soil erodibility factor (K) is a measure of the susceptibility of the soil to detachment and transport by rainfall. Soils having the highest numbers are the most erodible. The soil-loss tolerance factor (T) is the maximum rate of soil erosion, whether from rainfall or wind, that permits a high level of crop productivity to be sustained economically and indefinitely.

Table 7 contains information on soil and water features; namely, hydrologic groups, flooding, high water tables, and depth to and hardness of bedrock. Following are explanations of these features and some of the terms used in the table.

Hydrologic groups are those soils that have similar runoff potential under similar storm and cover conditions. The soils have been placed in four classes, designated A, B, C, or D. Class A soils have the lowest potential for runoff, and class D soils, the highest. Dual class ratings indicate the hydrologic groups for artificially drained and undrained conditions of a soil respectively.

Flooding is the temporary covering of soils by water from overflowing streams, runoff from adjacent slopes,

TABLE 5.—*Estimated soil properties*

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Soil series and map symbols	Depth	USDA texture	Classification	
			Unified	AASHTO
	In			
Belden: Be	0-7	Silt loam	CL, ML, CL-ML	A-4
	7-60	Silt loam, silty clay loam, clay loam	CL, ML	A-6, A-7
Bigbee: Bg	0-17	Loamy sand	SM, SP-SM	A-2-4, A-3
	17-80	Sand, fine sand	SP-SM, SM	A-2-4, A-3
Binnsville: BnB	0-8	Silty clay, silty clay loam	CL, CH	A-7
	8-12	Silty clay loam, silty clay	CL, CH	A-7
	12-48	Weathered bedrock.		
Brooksville: BrA, BrB	0-12	Silty clay	CL, CH	A-7
	12-70	Silty clay, clay	CH	A-7
Cahaba: CaA	0-17	Sandy loam	SM	A-4, A-2-4
	17-42	Sandy clay loam, loam, clay loam	SC, CL	A-4, A-6
	42-80	Loamy sand, fine sandy loam	SM, SP-SM	A-2-4
Chalk outcrop: CoD.				
Chalk outcrop part. Too variable for valid estimates.				
Demopolis part	0-5	Silty clay loam	CL, CL-ML	A-4, A-6, A-7
Mapped only in complex with	5-9	Silty clay loam, clay loam	GM, GC, GM-GC	A-2
Chalk outcrop.	9-24	Chalk.		
Griffith: Gr	0-10	Silty clay	CL, CH	A-7
	10-66	Silty clay, clay	CH	A-7
Kipling: KpA, KpB2, KpC2	0-4	Silt loam	CL-ML, CL	A-6, A-4, A-7
	4-50	Silty clay, clay, silty clay loam	CH, CL	A-7, A-6
	50-68	Clay, silty clay	CH	A-7
Leeper: Le	0-7	Silty clay, silty clay loam	CH, CL	A-7
	7-60	Clay, silty clay, silty clay loam	CH	A-7
Longview: LoA, LoB	0-8	Silt loam	CL	A-4, A-6
	8-51	Silt loam, silty clay loam	CL	A-6
	51-80	Silty clay loam, silt loam	CL, CH	A-7, A-6
Mathiston: Ma	0-6	Silt loam	CL	A-4, A-6
	6-50	Silty clay loam, loam, silt loam	CL	A-6, A-7
Mayhew: MhA	0-5	Silt loam	CL	A-6, A-7
	5-48	Silty clay loam, silty clay, clay	CH, CL	A-7
Okolona: OkA, OkB	0-8	Silty clay	CL, CH	A-7
	8-65	Silty clay, clay	CH	A-7
Ora: OrB, OrC2, OrD2	0-6	Loam	SM-SC, SM, ML, CL-ML	A-4, A-2
	6-26	Clay loam, sandy clay loam, loam	CL	A-6, A-4, A-7
	26-56	Sandy clay loam, loam, sandy loam	CL	A-6, A-7, A-4
Ozan: Oz	0-19	Sandy loam	SM, ML	A-4
	19-58	Loam, sandy loam	ML, CL-ML, CL	A-4
	58-80	Loam, sandy clay loam, sandy loam	CL, CL-ML, ML	A-4, A-6
Prentiss: PrA, PrB	0-26	Sandy loam, loam	ML, CL-ML, SM, CL, SC, SM-SC	A-4
	26-60	Loam, sandy loam, fine sandy loam	CL, ML, SC, SM, CL-ML, SM-SC	A 6, A 4
Ruston: RuC	0-7	Fine sandy loam	SM, ML	A-4, A-2-4
	7-38	Loam, clay loam	SC, CL	A-6
	38-58	Fine sandy loam, sandy loam	SM, SM-SC, ML, CL-ML	A-4, A-2-4
	58-80	Sandy clay loam, loam, clay loam	SC-CL	A-6
Sessum: Se	0-4	Silty clay	CH, CL	A 7
	4-44	Silty clay, silty clay loam	CH	A-7
	44-62	Clay	CH	A-7
Smithdale: SRE.				
Smithdale part	0-12	Fine sandy loam	SM, SM-SC	A-4
	12-28	Clay loam, sandy clay loam, loam	SM-SC, SC, CL, CL-ML	A-6, A-4
	28-80	Loam, sandy loam	SM, ML, CL, SC, SM-SC, CL-ML	A-4

significant in engineering

means less than]

Fragments more than 3 in.	Percentage passing sieve No.— 4	10	40	200	Liquid limit	Plasticity index
Pct					Pct	
0	100	100	70-100	51-100	<30	[1] NP-10
0	100	100	100	70-95	30-50	12-25
0	100	95-100	80-95	5-30		NP
0	85-100	85-100	80-100	5-20		NP
0	90-100	80-100	75-100	70-95	44-57	22-32
10-20	60-90	60-90	60-90	60-90	44-57	22-32
0	100	100	95-100	85-95	46-60	25-36
0	100	100	95-100	90-95	50-70	36-65
0	95-100	95-100	65-90	30-45		NP
0	90-100	80-100	75-90	40-75	23-35	8-15
0	95-100	90-100	60-85	10-35		NP
0	85-100	75-90	65-85	50-80	22-44	6-20
0	20-30	15-25	10-20	8-15	18-38	4-14
0	100	95-100	95-100	85-95	45-55	24-32
0	100	95-100	75-95	75-95	55-78	32-50
0	100	100	90-100	70-95	20-45	8-25
0	100	100	95-100	85-95	38-70	22-45
0	100	100	90-100	75-95	60-80	35-50
0	100	100	90-100	80-95	45-70	25-45
0	100	100	95-100	80-97	52-75	30-50
0	100	100	95-100	70-90	25-35	7-15
0	100	100	90-100	80-95	28-37	11-16
0	100	100	95-100	75-90	38-55	18-30
0	100	100	85-100	60-95	25-35	7-15
0	100	100	85-100	70-90	30-45	15-25
0	100	100	90-100	70-95	36-50	15-28
0	100	100	95-100	85-95	46-75	25-50
0	100	100	95-100	85-95	46-55	25-32
0	95-100	95-100	95-100	90-95	60-90	36-65
0	100	95-100	65-85	30-65	<30	NP-5
0	100	95-100	80-100	50-80	25-48	8-22
0	100	95-100	80-100	50-75	25-43	8-25
0	95-100	95-100	90-100	40-75	<20	NP-3
0	95-100	95-100	90-100	51-80	<30	NP-10
0	95-100	95-100	90-100	51-85	<35	NP-18
0	100	100	65-100	36-75	<30	NP-10
0	100	100	70-100	40-75	20-35	4-12
0	85-100	78-100	65-100	30-75	<20	NP-3
0	85-100	78-100	70-100	36-75	30-40	11-18
0	85-100	78-100	65-100	30-75	<27	NP-7
0	85-100	78-100	70-100	36-75	30-40	11-18
0	100	100	95-100	90-95	45-65	25-40
0	100	100	90-100	80-95	55-80	30-55
0	100	100	95-100	80-90	55-85	30-50
0	100	85-100	60-80	36-49	<20	NP-5
0	100	85-100	80-95	45-75	23-38	7-15
0	100	85-100	65-80	36-70	<30	NP-10

TABLE 5.—*Estimated soil properties*

Soil series and map symbols	Depth	USDA texture	Classification: Unified	Classification: AASHTO
	In			
Ruston part	0-7	Fine sandy loam	SM, ML	A-4, A-2-4
	7-38	Loam, clay loam	SC, CL	A-6
	38-58	Fine sandy loam, sandy loam	SM, SM-SC, ML, CL-ML	A-4, A-2-4
	58-80	Sandy clay loam, loam, clay loam	SC-CL	A-6
Stough: StA	0-5	Sandy loam	SM-SC, SM, ML, CL-ML	A-4
	5-26	Loam, fine sandy loam	ML, CL, CL-ML	A-4
	26-57	Sandy loam, sandy clay loam, loam	SM, SC, CL, ML	A-4, A-6
Sumter: SuB2, SuC2	0-5	Silty clay loam	CL, ML	A-7
	5-22	Silty clay, clay, silty clay loam	CH, CL	A-7
	22-54	Weathered bedrock.		
Sweatman:				
SwC	0-4	Fine sandy loam	CL-ML, CL, ML	A-4
	4-24	Clay, silty clay, silty clay loam	MH, CH, CL	A-7
	24-38	Clay, silty clay, silty clay loam	MH, CH, CL	A-7
	38-60	Weathered bedrock, stratified	ML, CL, CL-ML	A-4
SXE:				
Sweatman part	0-4	Fine sandy loam	CL-ML, CL, ML	A-4
	4-24	Clay, silty clay, silty clay loam	MH, CH, CL	A-7
	24-38	Clay, silty clay, silty clay loam	MH, CH, CL	A-7
	38-60	Weathered bedrock, stratified	ML, CL, CL-ML	A-4
Smithdale part	0-12	Fine sandy loam	SM, SM-SC	A-4
	12-28	Clay loam, sandy clay loam, loam	SM-SC, SC, CL, CL-ML	A-6, A-4
	28-80	Loam, sandy loam	SM, ML, CL, SC, SM-SC, CL-ML	A-4
Tippah: ThB	0-6	Silt loam	CL, CL-ML	A-4
	6-30	Silty clay loam, silt loam	CL	A-6, A-7
	30-62	Silty clay loam, silty clay, clay	CH	A-7
	62-80	Weathered bedrock.		
Tuscumbia: TL.				
Tuscumbia part	0-6	Silty clay	CL	A-7, A-6
	6-60	Clay, silty clay, silty clay loam	CH	A-7
Leeper part	0-7	Silty clay, silty clay loam	CH, CL	A-7
	7-60	Clay, silty clay, silty clay loam	CH	A-7
Una: Un	0-5	Clay loam	CL, CL-ML, SC, SM-SC	A-6, A-4
	5-52	Clay, silty clay	CH, CL	A-7
Urbo: Ur	0-6	Silty clay loam	CL	A-6
	6-60	Silty clay loam, silty clay, clay	CL, CH	A-7
Wilcox: WcB, WcC, WcD	0-4	Silt loam	CL, CH	A-7
	4-23	Clay, silty clay, silty clay loam	CH, MH	A-7
	23-45	Clay	CH, MH	A-7
	45-60	Weathered bedrock.		

[1] Nonplastic.

TABLE 6.—*Estimated chemical*

[The symbol <

Soil series and map symbols	Depth	Permeability	Available water capacity	Soil reaction
	In	*In per hr*	*In per in of soil*	*pH*
Belden: Be	0-7	0.6-2.0	0.20-0.22	5.6-7.3
	7-60	0.6-2.0	0.19-0.22	5.6-7.3
Bigbee: Bg	0-17	6.0-20.0	0.05-0.10	4.5-6.0
	17-80	6.0-20.0	0.05-0.08	4.5-6.0
Binnsville: BnB	0-8	0.06-0.2	0.15-0.18	7.9-8.4
	8-12	0.06-0.2	0.12-0.16	7.9-8.4
Brooksville: BrA, BrB	0-12	0.06-0.2	0.20-0.22	5.1-6.5
	12-70	<0.06	0.18-0.20	6.6-8.4

significant in engineering—Continued

Fragments more than 3 in.	Percentage passing sieve No.— 4	10	40	200	Liquid limit	Plasticity index
Pct					*Pct*	
0	85-100	78-100	65-100	30-75	<20	NP-3
0	85-100	78-100	70-100	36-75	30-40	11-18
0	85-100	78-100	65-100	30-75	<27	NP-7
0	85-100	78-100	70-100	36-75	30-40	11-18
0	100	100	65-95	35-65	<25	NP-7
0	100	100	75-95	50-75	<25	NP-8
0	100	100	65-90	40-65	25-40	8-15
0	99-100	99-100	98-100	85-90	41-50	16-25
0	100	99-100	99-100	90-95	41-55	16-32
0	100	100	90-100	55-90	<35	NP-10
0	95-100	95-100	95-100	90-95	42-80	18-40
0	95-100	80-100	95-100	70-85	42-80	18-42
0	95-100	75-100	60-95	55-95	<30	NP-10
0	100	100	90-100	55-90	<35	NP-10
0	95-100	95-100	95-100	90-95	42-80	18-40
0	95-100	80-100	95-100	70-85	42-80	18-42
0	95-100	75-100	60-95	55-95	<30	NP-10
0	100	85-100	60-80	36-49	<20	NP-5
0	100	85-100	80-95	45-75	23-38	7-15
0	100	85-100	65-80	36-70	<30	NP-10
0	100	100	90-100	70-90	20-30	4-10
0	100	98-100	90-100	85-95	30-45	11-22
0	100	99-100	80-100	60-95	50-65	25-40
----------	100	100	90-100	75-90	35-50	15-25
----------	100	100	95-100	80-95	51-75	30-50
0	100	100	90-100	80-95	45-70	25-45
0	100	100	95-100	80-97	52-75	30-50
0	100	100	80-95	40-80	20-45	4-22
0	100	100	90-100	75-95	41-65	20-40
0	100	100	95-100	95-100	30-40	15-25
0	100	100	95-100	80-98	44-62	20-36
0	100	100	95-100	80-95	41-51	19-25
0	100	100	95-100	80-95	50-72	22-40
0	100	100	90-100	75-95	60-135	39-80

and physical properties

means less than]

Shrink-swell potential	Risk of corrosion: Uncoated steel	Concrete	Erosion factors: K	T
Low	High	Low		
Moderate	High	Low		
Low	Low	Moderate	0.17	5
Low	Low	Moderate	0.17	
Moderate	Moderate	Low	0.37	1
Moderate	Moderate	Low	0.37	
Very high	High	Moderate	0.37	4
Very high	High	Moderate	0.37	

TABLE 6.—*Estimated chemical and*

Soil series and map symbols	Depth	Permeability	Available water capacity	Soil reaction
	In	*In per hr*	*In per in of soil*	*pH*
Cahaba: CaA	0-17	2.0-6.0	0.05-0.14	4.5-6.0
	17-42	0.6-2.0	0.12-0.15	4.5-6.0
	42-80	6.0-20.0	0.05-0.10	4.5-6.0
Chalk outcrop: CoD.				
Chalk outcrop part.				
Too variable to be rated.				
Demopolis part	0-5	0.2-0.6	0.15-0.18	7.9-8.4
	5-9	0.2-0.6	0.10-0.15	7.9-8.4
Griffith: Gr	0-10	<0.06	0.18-0.20	6.6-8.4
	10-66	<0.06	0.15-0.18	6.6-8.4
Kipling: KpA, KpB2, KpC2	0-4	0.06-0.20	0.20-0.22	4.0-6.0
	4-50	0.06-0.20	0.20-0.22	4.0-8.4
	50-68	<0.06	0.18-0.20	5.1-8.4
Leeper: Le	0-7	0.06-0.2	0.18-0.22	5.6-8.4
	7-60	<0.06	0.18-0.20	5.6-8.4
Longview: LoA, LoB	0-8	0.6-2.0	0.20-0.22	4.5-7.3
	8-51	0.2-0.6	0.18-0.20	4.5-5.5
	51-80	0.2-0.6	0.15-0.20	4.5-5.5
Mathiston: Ma	0-6	0.6-2.0	0.18-0.22	4.5-5.5
	6-50	0.6-2.0	0.18-0.22	4.5-5.5
Mayhew: MhA	0-5	0.06-0.2	0.20-0.22	4.5-6.0
	5 48	<0.06	0.18-0.20	4.5 6.0
Okolona: OkA, OkB	0-8	<0.06	0.20-0.22	6.6-8.4
	8-65	<0.06	0.18-0.20	6.6-8.4
Ora: OrB, OrC2, OrD2	0-6	2.0-6.0	0.10-0.13	4.0-5.5
	6-26	0.6-2.0	0.12-0.18	4.0-5.5
	26-56	0.2-0.6	0.05-0.10	4.0-5.5
Ozan: Oz	0-19	0.6-2.0	0.14-0.17	4.5-6.0
	19-58	0.06-0.2	0.15-0.18	4.5-6.0
	58-80	0.06-0.2	0.15-0.18	4.5-6.0
Prentiss: PrA, PrB	0-26	0.6-2.0	0.12-0.16	4.5-5.5
	26-60	0.2-0.6	0.06-0.09	4.5-5.5
Ruston: RuC	0-7	0.6-2.0	0.09-0.16	4.5-5.5
	7-38	0.6-2.0	0.12-0.17	4.5-5.5
	38-52	0.6-2.0	0.12-0.15	4.5-5.5
	52-80	0.6-2.0	0.12-0.17	4.5-5.5
Sessum: Se	0-4	0.06-0.20	0.18-0.20	4.5-6.0
	4-44	<0.06	0.17-0.19	4.5-6.0
	44 62	<0.06	0.10-0.15	5.6-8.4
Smithdale: SRE.				
Smithdale part	0-12	2.0-6.0	0.14-0.16	4.5-5.5
	12-28	0.6-2.0	0.15-0.17	4.5-5.5
	28-80	2.0-6.0	0.14-0.16	4.5-5.5
Ruston part	0-7	0.6-2.0	0.09-0.16	4.5-5.5
	7-38	0.6-2.0	0.12-0.17	4.5-5.5
	38-52	0.6-2.0	0.12-0.15	4.5-5.5
	52-80	0.6-2.0	0.12-0.17	4.5-5.5
Stough: StA	0-5	0.6-2.0	0.12-0.18	4.5-5.5
	5-26	0.2-0.6	0.07-0.11	4.5-5.5
	26-57	0.2-0.6	0.07-0.11	4.5-5.5
Sumter: SuB2, SuC2	0-5	0.06-2.0	0.12-0.17	7.4-8.4
	5-22	0.06-2.0	0.12-0.17	7.4-8.4
	22-54	---	---	---
Sweatman:				
SwC	0-4	0.6-2.0	0.20-0.22	4.5-5.5
	4-24	0.2-0.6	0.16-0.20	4.5-5.5
	24-38	0.2-0.6	0.16-0.20	4.5-5.5
	38-60	0.2-0.6	0.10-0.18	4.5-5.5
SXE:				
Sweatman part	0-4	0.6-2.0	0.20-0.22	4.5-5.5
	4-24	0.2-0.6	0.16-0.20	4.5-5.5
	24-38	0.2 0.6	0.16-0.20	4.5-5.5
	38-60	0.2-0.6	0.10-0.18	4.5-5.5

physical properties—Continued

Shrink-swell potential	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete	Erosion factors: K	Erosion factors: T
Very low	Low	Moderate	0.24	4
Low	Moderate	Moderate	0.20	
Very low	Low	Moderate	0.24	
Moderate	Moderate	Low	0.37	1
Low	Moderate	Low	0.24	
High	High	Low		
Very high	High	Low		
Moderate	High	High	0.32	4
Very high	High	High	0.32	
Very high	High	High	0.32	
High	High	Low		
High	High	Low		
Low	High	High	0.37	3
Low	High	High	0.37	
Moderate	High	High	0.37	
Low	High	High		
Low	High	High		
Moderate	High	High	0.37	5
High	High	High	0.32	
High	High	Moderate	0.37	4
Very high	High	Moderate	0.37	
Low	Moderate	High	0.32	3
Low	Moderate	High	0.32	
Low	Moderate	High	0.37	
Low	High	Moderate		
Low	High	Moderate		
Low	High	Moderate		
Low	Moderate	High	0.24	3
Low	Moderate	High	0.28	
Low	Low	Moderate	0.32	5
Moderate	Moderate	Moderate	0.28	
Low	Low	Moderate	0.32	
Moderate	Moderate	Moderate	0.28	
High	High	Moderate		
Very high	High	Moderate		
Very high	High	Moderate		
Low	Low	Moderate	0.28	5
Low	Low	Moderate	0.24	
Low	Low	Moderate	0.28	
Low	Low	Moderate	0.32	5
Moderate	Moderate	Moderate	0.28	
Low	Low	Moderate	0.32	
Moderate	Moderate	Moderate	0.28	
Low	Moderate	High	0.28	3
Low	Moderate	High	0.37	
Low	Moderate	High	0.37	
High	Moderate	Low	0.37	3
High	Moderate	Low	0.37	
Low	High	High	0.37	3
Moderate	High	High	0.28	
Moderate	High	High	0.28	
Moderate	High	High		
Low	High	High	0.37	3
Moderate	High	High	0.28	
Moderate	High	High	0.28	
Moderate	High	High		

TABLE 6.—*Estimated chemical and*

Soil series and map symbols	Depth	Permeability	Available water capacity	Soil reaction
	In	*In per hr*	*In per in of soil*	*pH*
Smithdale part	0-12 12-28 28-80	2.0-6.0 0.6-2.0 2.0-6.0	0.14-0.16 0.15-0.17 0.14-0.16	4.5-5.5 4.5-5.5 4.5-5.5
Tippah: ThB	0-6 6 30 30-62	0.6-2.0 0.06-0.2 0.06-0.2	0.20-0.22 0.19-0.21 0.16-0.18	4.5-6.0 4.5-6.0 4.5-6.0
Tuscumbia: TL.				
Tuscumbia part	0-6 6-60	0.06-0.20 <0.06	0.20-0.22 0.18-0.20	5.6-8.4 5.6-8.4
Leeper part	0-7 7-60	0.06-0.2 <0.06	0.18-0.22 0.18-0.20	5.6 8.4 5.6-8.4
Una: Un	0 5 5-52	0.6 2.0 <0.06	0.12-0.18 0.15-0.20	4.5-5.5 4.5-5.5
Urbo: Ur	0-6 6-60	0.06-0.2 <0.06	0.19-0.21 0.18-0.20	4.5-5.5 4.5-5.5
Wilcox: WcB, WcC, WcD	0-4 4-23 23-45	0.06-0.2 <0.06 <0.06	0.19-0.21 0.18-0.20 0.15-0.18	4.0-5.5 4.0-5.5 4.0-5.5

TABLE 7.—*Soil and*

[The symbol >

Soil series and map symbols	Hydrologic group	Flooding		
		Frequency	Duration	Months
Belden: Be	C	Common	Brief	January to March
Bigbee: Bg	A	Rare to common	Brief	January to March
Binnsville: BnB	D	None		
Brooksville: BrA, BrB	D	None		
Cahaba: CaA	B	None to occasional	Very brief	November to February
Chalk outcrop: CoD.				
Chalk outcrop part		None		
Demopolis part	C	None		
Griffith: Gr	D	Frequent	Brief	January to March
Kipling: KpA, KpB2, KpC2	D	None		
Leeper: Le	D	Common	Brief	January to March
Longview: LoA, LoB	C	None		
Mathiston: Ma	C	Common	Very brief to long	January to April
Mayhew: MhA	D	None		
Okolona: OkA, OkB	D	None		
Ora: OrB, OrC2, OrD2	C	None		
Ozan: Oz	D	None		
Prentiss: PrA, PrB	C	None		
Ruston: RuC	B	None		
Sessum: Se	D	None		
Smithdale: SRE.				
Smithdale part	B	None		
Ruston part	B	None		
Stough: StA	C	None		
Sumter: SuB2, SuC2	C	None		
Sweatman:				
SwC	C	None		
SXE:				
Sweatman part	C	None		
Smithdale part	B	None		
Tippah: ThB	C	None		
Tuscumbia: TL.				
Tuscumbia part	D	Common	Brief to long	January to March
Leeper part	D	Common	Brief	January to March
Una: Un	D	Common	Brief to long	January to March
Urbo: Ur	D	Common	Brief to long	January to March
Wilcox: WcB, WcC, WcD	D	None		

physical properties—Continued

Shrink-swell potential	Risk of corrosion		Erosion factors	
	Uncoated steel	Concrete	K	T
Low	Low	Moderate	0.28	5
Low	Low	Moderate	0.24	
Low	Low	Moderate	0.28	
Low	High	High	0.43	4
Moderate	High	High	0.43	
High	High	High	0.43	
High	High	Low		
Very high	High	Low		
High	High	Low		
High	High	Low		
Low	High	High		
High	High	High		
Low	High	High		
Moderate	High	High		
High	High	High	0.32	4
High	High	High	0.32	
High	High	High	0.28	

water features

means more than]

High water table			Bedrock	
Depth	Kind	Months	Depth	Hardness
Ft			*In*	
1.0-1.5	Apparent	January to March	>60	
3.5-6.0	Apparent	January to March	>60	
>6.0			6-20	Rippable.
2.0-4.0	Perched	January to March	>60	
>6.0			>60	
>6.0			1-2	Rippable.
>6.0			4-16	Rippable.
1.5-2.5	Apparent	January to March	>60	
1.5-3.0	Perched	January to March	36->60	Rippable.
1.0-2.0	Apparent	January to March	>60	
1.0-3.0	Perched	December to April	>60	
1.5-2.5	Apparent	January to April	>60	
0-1.0	Apparent	January to March	>60	
4.0-6.0	Apparent	January to March	48->60	Rippable.
2.0-3.5	Perched	February to April	>60	
1.0-2.5	Perched	December to May	>60	
2.0-2.5	Perched	January to March	>60	
>6.0			>60	
0.5-1.5	Perched	February to April	>60	
>6.0			>60	
>6.0			>60	
1.0-1.5	Perched	January to April	>60	
>6.0			20-40	Rippable.
>6.0			>60	
>6.0			>60	
>6.0			>60	
1.5-3.0	Perched	December to April	>60	
0.5-1.5	Apparent	December to April	>60	
1.0-2.0	Apparent	January to March	>60	
0.5-1.0	Apparent	November to April	>60	
1.0-2.0	Apparent	January to March	>60	
1.5-3.0	Perched	January to April	40->60	Rippable.

TABLE 8.—*Soil ratings for sanitary facilities*

["Depth to rock" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of terms used to rate soils]

Soil series and map symbols	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Belden: Be	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Fair: too clayey.
Bigbee: Bg	Severe: floods	Severe: floods; seepage.	Severe: seepage; floods.	Severe: seepage; floods.	Fair: too sandy.
Binnsville: BnB	Severe: depth to rock; percs slowly.	Severe: depth to rock.	Severe: depth to rock; too clayey.	Severe: depth to rock.	Poor: too clayey; depth to rock.
Brooksville:					
BrA	Severe: percs slowly; wetness.	Favorable	Severe: too clayey; wetness.	Severe: wetness	Poor: too clayey; wetness.
BrB	Severe: percs slowly; wetness.	Moderate: slope	Severe: too clayey; wetness.	Severe: wetness	Poor: too clayey; wetness.
Cahaba: CaA	Severe: floods	Severe: seepage	Severe: seepage; floods.	Severe: seepage; floods.	Favorable.
Chalk outcrop: CoD.					
Chalk outcrop part	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: slope	Poor: thin layer.
Demopolis part	Severe: depth to rock; percs slowly.	Severe: depth to rock; slope.	Severe: depth to rock.	Moderate: slope	Poor: thin layer; small stones.
Griffith: Gr	Severe: floods; percs slowly; wetness.	Favorable	Severe: floods; too clayey; wetness.	Severe: floods; wetness.	Poor: too clayey; wetness.
Kipling:					
KpA	Severe: percs slowly	Favorable	Severe: too clayey	Moderate: wetness	Poor: too clayey.
KpB2, KpC2	Severe: percs slowly	Moderate: slope	Severe: too clayey	Moderate: wetness	Poor: too clayey.
Leeper: Le	Severe: percs slowly; wetness; floods.	Favorable	Severe: too clayey; floods; wetness.	Severe: floods; wetness.	Poor: too clayey; wetness.
Longview:					
LoA	Severe: percs slowly; wetness.	Favorable	Severe: wetness	Moderate: wetness	Favorable.
LoB	Severe: percs slowly; wetness.	Moderate: slope	Severe: wetness	Moderate: wetness	Favorable.
Mathiston: Ma	Severe: floods; wetness.	Moderate: seepage	Severe: floods	Severe: floods	Fair: too clayey.
Mayhew: MhA	Severe: percs slowly; wetness.	Favorable	Severe: too clayey; shrink-swell; wetness.	Severe: wetness	Poor: wetness; too clayey.
Okolona:					
OkA	Severe: percs slowly	Favorable	Severe: too clayey	Favorable	Poor: too clayey.
OkB	Severe: percs slowly	Moderate: slope	Severe: too clayey	Favorable	Poor: too clayey.
Ora:					
OrB, OrC2	Severe: percs slowly	Moderate: slope	Favorable	Favorable	Favorable.
OrD2	Severe: percs slowly	Severe: slope	Favorable	Moderate: slope	Favorable.
Ozan: Oz	Severe: wetness; percs slowly.	Favorable	Severe: wetness	Severe: wetness	Poor: wetness.
Prentiss:					
PrA	Severe: percs slowly; wetness.	Favorable	Severe: wetness	Severe: wetness	Favorable.
PrB	Severe: percs slowly; wetness.	Moderate: slope	Severe: wetness	Severe: wetness	Favorable.
Ruston: RuC	Moderate: percs slowly.	Moderate: slope; seepage.	Favorable	Favorable	Favorable.
Sessum: Se	Severe: percs slowly; wetness.	Favorable	Severe: wetness; too clayey.	Severe: wetness	Poor: wetness; too clayey.
Smithdale: SRE.					
Smithdale part	Severe: slope	Severe: seepage; slope.	Moderate: slope	Severe: slope	Poor: slope.
Ruston part	Moderate: percs slowly.	Moderate: slope; seepage.	Favorable	Favorable	Favorable.
Stough: StA	Severe: percs slowly	Moderate: seepage	Moderate: wetness	Moderate: wetness	Favorable.
Sumter:					
SuB2	Severe: percs slowly; depth to rock.	Severe: depth to rock.	Severe: depth to rock; too clayey.	Favorable	Poor: too clayey.

TABLE 8.—*Soil ratings for sanitary facilities*—Continued

Soil series and map symbols	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SuC2	Severe: percs slowly; depth to rock.	Severe: slope; percs slowly; depth to rock.	Severe: depth to rock; too clayey.	Moderate: slope	Poor: too clayey.
Sweatman:					
SwC	Severe: percs slowly	Severe: slope	Moderate: too clayey	Moderate: slope	Poor: thin layer.
SXE:					
Sweatman part	Severe: slope; percs slowly.	Severe: slope	Moderate: too clayey	Severe: slope	Poor: slope; thin layer.
Smithdale part	Severe: slope	Severe: seepage; slope.	Moderate: slope	Severe: slope	Poor: slope.
Tippah: ThB	Severe: percs slowly	Moderate: slope	Severe: too clayey	Severe: wetness	Poor: too clayey.
Tuscumbia: TL.					
Tuscumbia part	Severe: percs slowly; floods.	Severe: wetness; floods.	Severe: wetness; too clayey; floods.	Severe: wetness; floods.	Poor: wetness; too clayey.
Leeper part	Severe: percs slowly; wetness; floods.	Favorable	Severe: too clayey; floods; wetness.	Severe: floods; wetness.	Poor: too clayey; wetness.
Una: Un	Severe: floods; percs slowly; wetness.	Severe: wetness; floods.	Severe: wetness; floods; too clayey.	Severe: wetness; too clayey; floods.	Poor: wetness; too clayey.
Urbo: Ur	Severe: percs slowly; floods; wetness.	Favorable	Severe: too clayey; wetness; floods.	Severe: floods; wetness.	Poor: too clayey; wetness; thin layer.
Wilcox:					
WcB, WcC	Severe: percs slowly	Moderate: slope	Severe: too clayey	Moderate: wetness; slope.	Poor: too clayey.
WcD	Severe: percs slowly	Severe: slope	Severe: too clayey	Moderate: wetness; slope.	Poor: too clayey.

TABLE 9.—*Soil ratings as sources of construction material*

["Shrink-swell" and some of the other terms that describe restrictive features are defined in the Glossary. See text for definitions of terms used to rate soils]

Soil series and map symbols	Road fill	Sand	Gravel	Topsoil
Belden: Be	Fair: wetness; shrink-swell.	Unsuited: excess fines	Unsuited: excess fines	Fair: wetness; shrink-swell.
Bigbee: Bg	Good	Fair: excess fines	Poor: excess fines	Poor: too sandy.
Binnsville: BnB	Poor: low strength	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey.
Brooksville: BrA, BrB	Poor: wetness; shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey.
Cahaba: CaA	Good	Poor: excess fines	Unsuited: excess fines	Fair: thin layer.
Chalk outcrop: CoD.				
Chalk outcrop part	Poor: thin layer	Unsuited	Unsuited	Poor: thin layer.
Demopolis part	Fair: shrink-swell	Unsuited: excess fines	Unsuited: excess fines	Poor: thin layer.
Griffith: Gr	Poor: shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey.
Kipling: KpA, KpB2, KpC2.	Poor: shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey.
Leeper: Le	Poor: wetness; shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: wetness; too clayey.
Longview: LoA, LoB	Fair: wetness; shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Good.
Mathiston: Ma	Poor: low strength	Unsuited: excess fines	Unsuited: excess fines	Fair: too clayey.
Mayhew: MhA	Poor: shrink-swell; wetness; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey; wetness.
Okolona: OkA, OkB	Poor: shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey.
Ora: OrB, OrC2, OrD2	Fair: low strength	Unsuited: excess fines	Unsuited: excess fines	Fair: too clayey.
Ozan: Oz	Poor: wetness	Poor: excess fines	Unsuited: excess fines	Poor: wetness.
Prentiss: PrA, PrB	Fair: low strength	Unsuited: excess fines	Unsuited: excess fines	Good.

TABLE 9.—*Soil ratings as sources of construction material*—Continued

Soil series and map symbols	Road fill	Sand	Gravel	Topsoil
Ruston: RuC	Fair: low strength	Unsuited: excess fines	Unsuited: excess fines	Fair: thin layer.
Sessum: Se	Poor: shrink-swell; wetness; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey; wetness.
Smithdale: SRE.				
Smithdale part	Fair: slope	Unsuited: excess fines	Unsuited: excess fines	Poor: slope.
Ruston part	Fair: low strength	Unsuited: excess fines	Unsuited: excess fines	Fair: thin layer.
Stough: StA	Fair: wetness; low strength.	Unsuited: excess fines	Unsuited: excess fines	Good.
Sumter: SuB2, SuC2	Poor: shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey.
Sweatman:				
SwC	Fair: shrink-swell	Unsuited: excess fines	Unsuited: excess fines	Poor: thin layer.
SXE:				
Sweatman part	Fair: shrink-swell; slope	Unsuited: excess fines	Unsuited: excess fines	Poor: thin layer.
Smithdale part	Fair: slope	Unsuited: excess fines	Unsuited: excess fines	Poor: slope.
Tippah: ThB	Poor: shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Fair: too clayey.
Tuscumbia: TL.				
Tuscumbia part	Poor: shrink-swell; low strength; wetness.	Unsuited: excess fines	Unsuited: excess fines	Poor: wetness; too clayey.
Leeper part	Poor: shrink-swell; low strength; wetness.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey; wetness.
Una: Un	Poor: wetness; shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: wetness.
Urbo: Ur	Poor: shrink-swell; wetness.	Unsuited: excess fines	Unsuited: excess fines	Fair: wetness; too clayey.
Wilcox: WcB, WcC, WcD	Poor: shrink-swell; low strength.	Unsuited: excess fines	Unsuited: excess fines	Poor: too clayey.

TABLE 10.—*Soil ratings as construction sites*

["Depth to rock" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of terms used to rate soils]

Soil series and map symbols	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Belden: Be	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness; corrosive.	Severe: floods; wetness; low strength.
Bigbee: Bg	Severe: floods; cutbanks cave.	Severe: floods	Severe: floods	Severe: floods	Severe: floods.
Binnsville: BnB	Severe: depth to rock; too clayey.	Severe: depth to rock; low strength.	Severe: depth to rock; low strength.	Severe: depth to rock; low strength.	Severe: depth to rock; low strength.
Brooksville: BrA, BrB.	Severe: wetness; too clayey.	Severe: shrink-swell; low strength.	Severe: wetness; shrink-swell; low strength.	Severe: shrink-swell; corrosive; low strength.	Severe: shrink-swell; low strength.
Cahaba: CaA	Slight	Slight	Slight	Slight	Slight.
Chalk outcrop: CoD.					
Chalk outcrop part	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.
Demopolis part	Moderate: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock; slope.	Moderate: depth to rock.
Griffith: Gr	Severe: floods; too clayey; wetness.	Severe: floods; shrink-swell; low strength.	Severe: floods; shrink-swell; low strength.	Severe: floods; shrink-swell; low strength.	Severe: shrink-swell; low strength.
Kipling: KpA, KpB2, KpC2.	Severe: too clayey	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength; corrosive.	Severe: shrink-swell; low strength.

TABLE 10.—*Soil ratings as construction sites*—Continued

Soil series and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets
Leeper: Le	Severe: floods; wetness; too clayey.	Severe: floods; wetness; shrink-swell.	Severe: floods; wetness; shrink-swell.	Severe: floods; wetness; shrink-swell.	Severe: floods; wetness; shrink-swell.
Longview: LoA, LoB	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness; corrosive.	Moderate: wetness; shrink-swell.
Mathiston: Ma	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness.	Severe: floods; wetness; corrosive.	Severe: floods; low strength.
Mayhew: MhA	Severe: too clayey; shrink-swell; wetness.	Severe: wetness; shrink-swell.	Severe: wetness; shrink-swell.	Severe: wetness; shrink-swell; low strength.	Severe: low strength; shrink-swell; wetness.
Okolona: OkA, OkB	Severe: too clayey	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: shrink-swell; corrosive; low strength.	Severe: shrink-swell; low strength.
Ora:					
OrB, OrC2	Slight	Moderate: low strength.	Moderate: low strength.	Moderate: low strength; slope.	Moderate: low strength.
OrD2	Moderate: slope	Moderate: low strength.	Moderate: low strength.	Severe: slope	Moderate: low strength.
Ozan: Oz	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Prentiss: PrA, PrB	Severe: wetness	Moderate: wetness; low strength.	Severe: wetness	Moderate: wetness; low strength.	Moderate: low strength.
Ruston: RuC	Slight	Slight	Slight	Moderate: slope	Moderate: low strength.
Sessum: Se	Severe: too clayey; wetness.	Severe: wetness; shrink-swell; low strength.	Severe: wetness; shrink-swell; low strength.	Severe: wetness; shrink-swell; corrosive.	Severe: shrink-swell; wetness; low strength.
Smithdale: SRE.					
Smithdale part	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Ruston part	Slight	Slight	Slight	Moderate: slope	Moderate: low strength.
Stough: StA	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Moderate: wetness.
Sumter:					
SuB2	Severe: depth to rock; too clayey.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.
SuC2	Severe: depth to rock; too clayey.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.	Severe: slope; shrink-swell; low strength.	Severe: shrink-swell; low strength.
Sweatman:					
SwC	Moderate: too clayey; slope.	Moderate: shrink-swell; slope.	Moderate: shrink-swell; slope.	Severe: slope	Moderate: shrink-swell; slope.
SXE:					
Sweatman part	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Smithdale part	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope.
Tippah: ThB	Severe: too clayey	Severe: low strength; shrink-swell.	Severe: low strength; shrink-swell.	Severe: low strength; shrink-swell; corrosive.	Severe: low strength; shrink-swell.
Tuscumbia: TL.					
Tuscumbia part	Severe: wetness; floods.	Severe: floods; shrink-swell; low strength.	Severe: floods; shrink-swell; low strength.	Severe: floods; shrink-swell; low strength.	Severe: floods; shrink-swell; low strength.
Leeper part	Severe: wetness; floods; too clayey.	Severe: floods; wetness; shrink-swell.	Severe: floods; wetness; shrink-swell.	Severe: shrink-swell; wetness; floods.	Severe: shrink-swell; wetness; floods.
Una: Un	Severe: wetness; floods; too clayey.	Severe: wetness; floods; shrink-swell.	Severe: wetness; floods; shrink-swell.	Severe: floods; wetness; low strength.	Severe: wetness; shrink-swell; floods.
Urbo: Ur	Severe: floods; wetness; too clayey.	Severe: floods; wetness; shrink-swell.	Severe: floods; wetness; shrink-swell.	Severe: floods; corrosive; wetness.	Severe: floods; shrink-swell.
Wilcox: WcB, WcC, WcD.	Severe: wetness; too clayey.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength; wetness.	Severe: shrink-swell; low strength.	Severe: shrink-swell; low strength.

TABLE 11.—*Soil ratings*

["Depth to rock" and some of the other terms that describe restrictive soil features

Soil series and map symbols	Limitations for— Pond reservoir areas	Embankments, dikes, and levees	Aquifer fed excavated ponds
Belden: Be	Moderate: percs slowly	Moderate: compressible; unstable fill; piping.	Severe: no water
Bigbee: Bg	Severe: seepage	Severe: seepage; piping	Severe: depth to water
Binnsville: BnB	Severe: depth to rock	Severe: depth to rock	Severe: depth to rock
Brooksville: BrA, BrB	Slight	Moderate: shrink-swell; unstable fill.	Severe: no water
Cahaba: CaA	Severe: seepage	Moderate: piping; erodes easily	Severe: deep to water
Chalk outcrop: CoD.			
Chalk outcrop part	Severe: depth to rock	Severe: thin layer	Severe: deep to water
Demopolis part	Severe: depth to rock	Severe: thin layer	Severe: no water
Griffith: Gr	Slight	Moderate: unstable fill; shrink-swell.	Severe: no water
Kipling: KpA, KpB2, KpC2	Slight	Moderate: unstable fill	Severe: no water
Leeper: Le	Slight	Moderate: unstable fill; shrink-swell.	Severe: deep to water
Longview: LoA, LoB	Moderate: seepage	Moderate: piping; erodes easily	Severe: no water
Mathiston: Ma	Moderate: seepage	Moderate: piping; low strength	Severe: no water
Mayhew: MhA	Slight	Moderate: hard to pack; shrink-swell; low strength.	Severe: no water
Okolona: OkA, OkB	Slight	Moderate: shrink-swell; unstable fill.	Severe: no water
Ora: OrB, OrC2, OrD2	Moderate: seepage	Moderate: piping	Severe: no water
Ozan: Oz	Slight	Moderate: unstable fill; piping	Severe: no water
Prentiss: PrA, PrB	Moderate: seepage	Moderate: compressible; piping	Severe: slow refill; deep to water
Ruston: RuC	Moderate: seepage	Slight	Severe: no water
Sessum: Se	Slight	Moderate: shrink-swell	Severe: no water
Smithdale: SRE.			
Smithdale part	Severe: seepage	Moderate: piping; unstable fill	Severe: no water
Ruston part	Moderate: seepage	Slight	Severe: no water
Stough: StA	Moderate: seepage	Moderate: piping; low strength	Severe: no water
Sumter: SuB2, SuC2	Slight	Moderate: shrink-swell; low strength; compressible.	Severe: deep to water
Sweatman:			
SwC	Moderate: seepage	Moderate: low strength	Severe: no water
SXE:			
Sweatman part	Moderate: seepage	Moderate: low strength	Severe: no water
Smithdale part	Severe: seepage	Moderate: piping; unstable fill	Severe: no water
Tippah: ThB	Slight	Moderate: shrink-swell; piping	Severe: no water
Tuscumbia: TL.			
Tuscumbia part	Slight	Moderate: unstable fill	Severe: deep to water; slow refill
Leeper part	Slight	Moderate: unstable fill; shrink-swell.	Severe: deep to water
Una: Un	Slight	Moderate: low strength; shrink-swell.	Severe: deep to water
Urbo: Ur	Slight	Moderate: low strength; shrink-swell.	Severe: no water
Wilcox: WcB, WcC, WcD	Slight	Moderate: low strength; shrink-swell.	Severe: no water

for water management

are defined in the Glossary. See text for definitions of terms used to rate soils]

Features affecting			
Drainage	Irrigation	Terraces and diversions	Grassed waterways
Floods; wetness	Slow intake; wetness	Wetness	Wetness.
Floods; cutbanks cave	Floods; seepage; droughty	Too sandy	Droughty.
Depth to rock	Rooting depth; percs slowly	Depth to rock; percs slowly	Rooting depth; percs slowly.
Percs slowly; wetness; slope	Percs slowly; wetness; slow intake.	Percs slowly; wetness	Favorable.
Not needed	Favorable	Favorable	Favorable.
Depth to rock	Rooting depth; slope; excess lime	Depth to rock	Rooting depth; slope.
Not needed	Erodes easily; rooting depth; slope.	Depth to rock; erodes easily; slope.	Erodes easily; rooting depth; slope.
Floods; percs slowly	Floods; percs slowly; slow intake	Percs slowly; wetness	Favorable.
Percs slowly; slope	Slow intake	Percs slowly	Percs slowly.
Floods; wetness; percs slowly	Slow intake; wetness	Percs slowly; wetness	Percs slowly; wetness.
Percs slowly; slope	Slow intake; erodes easily	Percs slowly; erodes easily	Percs slowly; erodes easily.
Cutbanks cave; floods; wetness	Slow intake; floods	Wetness; piping	Favorable.
Percs slowly; wetness; slope	Percs slowly; wetness	Percs slowly; wetness	Percs slowly; wetness.
Percs slowly; slope	Percs slowly; slow intake	Percs slowly	Favorable.
Percs slowly	Percs slowly	Favorable	Rooting depth.
Wetness; percs slowly	Wetness	Wetness	Wetness.
Percs slowly; wetness; slope	Percs slowly; wetness	Percs slowly; wetness; slope	Percs slowly; wetness; slope.
Not needed	Slope	Favorable	Slope.
Percs slowly; slope	Slow intake; percs slowly	Percs slowly; wetness	Percs slowly; wetness.
Not needed; slope	Fast intake; seepage; complex slope.	Slope; erodes easily	Slope; erodes easily.
Not needed	Slope	Favorable	Slope.
Percs slowly; wetness; slope	Percs slowly; wetness	Percs slowly; wetness	Percs slowly; wetness.
Not needed	Slow intake; percs slowly; slope	Complex slope; depth to rock; percs slowly.	Favorable.
Complex slope	Complex slope; erodes easily	Slope; erodes easily	Slope; erodes easily.
Complex slope	Complex slope; erodes easily	Slope; erodes easily	Slope; erodes easily.
Not needed; slope	Fast intake; seepage; complex slope.	Slope; erodes easily	Slope; erodes easily.
Cutbanks cave; percs slowly; slope.	Percs slowly; slope	Erodes easily; percs slowly; slope	Erodes easily; percs slowly; slope.
Floods; percs slowly	Floods; percs slowly	Not needed	Percs slowly; wetness.
Floods; wetness; percs slowly	Slow intake; wetness	Percs slowly; wetness	Percs slowly; wetness.
Wetness; floods	Wetness; slow intake	Wetness; percs slowly	Wetness; percs slowly.
Floods; percs slowly; wetness	Slow intake; wetness	Wetness	Wetness; percs slowly.
Percs slowly; slope	Slow intake; slope	Percs slowly; slope	Percs slowly; slope.

and tides (fig. 7). It does not include standing water for short periods following rains, nor water that commonly covers swamps and marshes. Flooding is estimated in terms of frequency, duration, and probable time of occurrence. Terms for frequency of flooding are: None—flooding is not reasonably possible; Rare—flooding is unlikely but is possible under unusual weather conditions; Common—flooding is likely under usual weather conditions. "Common" flooding may be further described as: *Occasional*—once in 2 years or less, on the average, or *Frequent*—more often than once in 2 years, on the average. Duration of flooding is expressed as: *Very brief*—less than 2 days; *Brief*—2 to 7 days; *Long*—7 days or longer. Time of flooding is expressed by the months when flooding normally happens.

Information on high water table gives the distance from the surface of the soil to the highest level that ground water reaches for significant periods during most years. The kind of high water table, apparent or perched, and the months when the water table is highest are also given. Apparent water table represents that level at which water stands in an uncased borehole after adequate time for adjustment in the surrounding soil. A perched water table is a water table that stands above an unsaturated zone in the soil.

Depth to bedrock is the distance from the surface of the soil to the upper surface of the rock layer. The hardness of the bedrock affects the ease of excavation. *Rippable* rock means that it is estimated that rock can be excavated using a single-tooth ripping attachment mounted on a 200 to 300 horsepower tractor. It is estimated that *hard* rock requires blasting or use of excavators stronger than 200 to 300 horsepower.

Engineering interpretations

The engineering interpretations in tables 8, 9, 10, and 11 are based on the estimated properties of soils shown in tables 5, 6, and 7, and on the experience of engineers and soil scientists with the soils of Clay County. In these interpretive tables ratings are shown of the limitations or suitabilities of the soils for specified purposes.

Soil limitations are indicated by the ratings slight, moderate, and severe. A rating of *slight* means that the soil properties are generally favorable for the rated use and that any limitations are minor and easily overcome. A rating of *moderate* means that some soil properties are unfavorable for the rated use but can be overcome or modified by special planning and design. A rating of *severe* means that the soil properties are so unfavorable and so difficult to correct or overcome as to require major soil reclamation, special designs, or intensive maintenance.

Soil suitability is rated by the terms *good, fair,* and *poor* which have, respectively, meanings approximately parallel to the terms for limitations of slight, moderate, and severe.

Figure 7.—The aftermath of a flash flood in March 1970.

In addition, the term *unsuited* is used for soils that have no potential as source of sand or gravel.

Soil ratings for sanitary facilities

Table 8 contains information on the limitations of the soils for sanitary facilities and the suitability of soils for daily cover of landfill. Following are explanations of some of the terms used in that table.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank into natural soil. The soil material between depths of 18 and 72 inches is evaluated for this use. The soil properties considered are those that affect both the absorption of effluent and the construction and operation of the system. Properties that affect absorption are permeability, depth to water table or rock, and susceptibility to flooding. Properties that affect difficulty of layout and construction are slope, risk of soil erosion, and lateral seepage. Slope and lateral seepage also affect the flow of effluent.

Sewage lagoon areas are shallow ponds constructed to hold sewage at a depth of 24 to 60 inches for a long enough period for bacteria to decompose the solid waste (fig. 8). A lagoon has a nearly level floor and has sides, or embankments, of compacted soil material. In determining the limitations of soils for the construction of sewage lagoons, properties that affect the pond floor and the embankments are considered. Those that affect the pond floor are permeability, content of organic matter, slope, and, if the floor needs to be leveled, depth to bedrock. The soil characteristics that commonly affect embankments are shear strength, compressibility, permeability of the compacted soil, susceptibility to piping, compactibility, and the amount of stones. Stones influence the ease of excavation and the ease of compaction of the embankment material.

Sanitary landfills are used to dispose of refuse. The waste is spread in thin layers, compacted, and covered with soil. Landfill areas are subject to heavy vehicular traffic. Some soil properties that affect suitability for landfill use are ease of excavation, hazard of polluting ground water, and trafficability. Ratings apply only to a depth of about 72 inches, and therefore ratings of *slight* or *moderate* may not be valid if excavations are much deeper. For some soils, reliable predictions can be made to greater depths, but in most instances geologic investigations are needed below a depth of about 72 inches.

Trench sanitary landfills are dug trenches in which refuse is buried daily, or more frequently if necessary. The refuse is covered with a layer of soil material at least 6 inches thick, usually soil excavated in digging the trench.

Figure 8.—Sewage lagoon for a hog parlor on Okolona silty clay, 0 to 1 percent slopes.

When a trench is full, a final cover of soil material, at least 24 inches thick, is placed over the landfill.

In the area-type of sanitary landfill, refuse is placed on the surface of the soil in successive layers. The daily and final cover material generally must be imported. A final cover of soil material, at least 24 inches thick, is placed over the completed fill.

Daily cover for landfill must frequently be obtained from a source away from the site of use, and therefore, soils from an area away from the landfill must be rated for suitability for use as cover material. Soils rated as suitable can be used as both daily and final cover material.

The suitability of a soil for use as cover is based on properties that reflect workability; ease of digging, moving, and spreading over the refuse daily during both wet and dry periods; slope; and thickness of the soil material. Also considered in the ratings is the damage that results in the area from which the soil material is taken.

Soil ratings for construction material

Table 9 contains information on the suitability of soils as sources of various construction material. Following are explanations of the interpretations given in the table.

Road fill is soil material used in embankments for roads. The suitability ratings reflect the predicted performance of soil after it has been placed in an embankment that has been properly compacted and provided with adequate drainage, and the relative ease of excavating the material at borrow areas.

Sand and gravel are used in great quantities in many kinds of construction. The ratings in table 9 provide guidance about where to look for probable sources of sand and gravel. A soil rated as a *good* or *fair* source generally has a layer at least 36 inches thick, the top of which is within a depth of 72 inches. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials, and they do not indicate quality of the deposit.

Topsoil is used to topdress an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil material, as for preparing a seedbed; natural fertility of the material, or the response of plants when fertilizer is applied; and absence of substances toxic to plants. The texture of a soil and the content of coarse fragments affect the suitability of a soil for use as topdressing. Also considered in the ratings is the damage that results in the area from which the topsoil is taken.

Soil ratings as construction sites

Table 10 contains information on the limitations of the soils for use as construction sites. Following are explanations of some of the interpretations given in that table.

Shallow excavations are those that require digging or trenching to a depth of less than 72 inches. Examples are excavations for pipelines, sewer lines, telephone and power transmission lines, basements, open ditches, and cemeteries. Desirable soil properties are good workability, resistance to sloughing, gentle slopes, absence of rock outcrops or big stones, and freedom from flooding or a high water table.

The ratings for dwellings and small commercial buildings in table 10 are for structures not more than three stories high and supported by foundation footings placed in undisturbed soil. Ratings are given for dwellings with or without basements. Ratings for small commercial buildings are for structures without basements. The features that affect the rating of a soil for dwellings are those that relate to the capacity to support a load and to resist settlement under load and are those that relate to the ease of excavation. Soil properties that affect the capacity to support a load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect ease of excavation are wetness, slope, and depth to bedrock.

The ratings for local roads and streets in table 10 are for an all-weather surface expected to carry automobile traffic all year. They have a subgrade of underlying soil material; a base consisting of gravel, crushed rock, or soil material stabilized with lime or cement; and a flexible or rigid surface, commonly asphalt or concrete. These roads are graded to shed water and have ordinary provisions for drainage. They are built mainly from soil at hand, and most cuts and fills are less than 72 inches deep.

Soil properties that most affect design and construction of roads and streets are the load-supporting capacity and the stability of the subgrade, and the workability and the quantity of cut and fill material available. The AASHTO and Unified classifications and the shrink-swell potential indicate the traffic-supporting capacity of a soil. Wetness and flooding affect the stability of soils. Slope, depth over hard rock, and wetness affect the ease of excavation of soils and the amount of cut and fill needed to reach an even grade.

Water management

Table 11 contains interpretations of the suitability of the soils for use in water management. Following are explanations of the interpretations given in that table.

Pond reservoirs are areas of water held behind a dam or embankment. Soils suitable for use as pond reservoir areas have low seepage, which is related to their permeability and depth over fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material that is resistant to seepage and piping and that has favorable stability, shrink-swell potential, shear strength, and compactibility. The presence of stones or organic matter in a soil are unfavorable factors in the suitability of a soil for use in embankments, dikes, and levees.

An aquifer-fed excavated pond is a body of water created by excavating a pit or dugout into a ground-water aquifer. Excluded are ponds that are fed by runoff and embankment ponds that impound water to a depth of more than 36 inches. The suitability ratings are for properly designed, located, and constructed ponds that impound good-quality water. Properties affecting aquifer-fed ponds are permanent water table and the permeability of the aquifer.

Drainage of soils is affected by such features as permeability; texture; structure; depth of cemented pan, rock, or other layers that influence rate of water movement; depth of the water table; slope; stability of ditchbanks; susceptibility to stream overflow; salinity and alkalinity; and availability of outlets for drainage.

The irrigation of a soil is affected by such features as

slope; susceptibility to flooding, water erosion, and soil blowing; texture; content of stones; accumulations of salts and alkalis; depth of root zone; rate of water intake at the surface; permeability of the soil below the surface; available water capacity; need for drainage; depth of the water table; and depth over bedrock.

Terraces and diversions are low ridges constructed across a slope to intercept runoff and allow it to soak into the soil or flow slowly to a prepared outlet. Features that affect suitability of a soil for terraces and diversions are uniformity and steepness of slope; depth over bedrock or other unfavorable material; permeability; and resistance to water erosion, soil slipping, and soil blowing. A suitable soil provides outlets for runoff and is not difficult to vegetate.

Grassed waterways are used to carry runoff water safely to outlets. The features that affect the use of soils for waterways are permeability, erodibility, and suitability for permanent vegetation.

Use of Soils for Recreational Development [6]

Most of the soils of Clay County are potentially suitable for recreational development. Soils on flood plains are well suited for some kinds of recreation because they are generally in long, winding areas along streams and adjacent scenic uplands. An onsite assessment of flooding height, duration, and frequency should be made in these areas before recreational facilities are developed.

Knowledge of soils is necessary in planning, developing, and maintaining areas used for recreation. In table 12, the soils of Clay County are rated according to limitations that affect their suitability for camp areas, picnic areas, playgrounds, and paths and trails. The limitations are determined by the kind and degree of restrictive soil features, such as flooding, topsoil texture, wetness, and others. Suitability of soils for growing and maintaining vegetation is not a part of these ratings. It is, however, an important item to consider in evaluating a site. Likewise, esthetic values, water supply, sewage disposal, and the size and shape of soil areas are not considered in the ratings. Soils subject to flooding vary in their degrees of limitations for recreational use, depending on the duration of the flooding, as well as on the season.

Additional interpretive information of soils useful for the planning and development of recreational facilities is continued in several tables in the section "Engineering Uses of the Soils." Especially helpful are interpretations for septic tank absorption fields in table 8 and for dwellings without basements and local roads and streets in table 10.

The soils are rated as having slight, moderate, or severe limitations for specified uses. A limitation of *slight* means that soil properties are generally favorable and limitations are so minor that they can easily be overcome. A *moderate* limitation can be overcome or modified by plans, designs, or special maintenance. A *severe* limitation means that costly soil reclamation, special design, intense maintenance, or a combination of these, is required.

Camp areas are used intensively as sites for tents and camp trailers and for the accompanying activities of outdoor living. Little preparation of the site is required, other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils are gently sloping, are well drained, are free of rocks and coarse fragments on the surface, are not subject to flooding during the season of use, have a surface that is firm after rains and not dusty when dry, and have a rapid percolation rate.

Picnic areas are attractive natural or landscaped tracts used mainly for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet and not dusty when dry, are not subject to flooding during the season of heavy use, and do not have slopes and stones that greatly increase the cost of leveling the sites or of building access roads.

Playgrounds are areas used intensively for baseball, football, badminton, and other outdoor games. Soils suitable for this use should be able to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and rock outcrops on the surface, are well drained, are not subject to flooding during season of heavy use, are firm after rains, and are not dusty when dry. If grading and leveling are required, the depth over rock is an important consideration.

Paths and trails are used for local and cross-country travel on bicycles, motorbikes, foot, or horseback. The design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet, are not dusty when dry, are not subject to flooding more than once during the season of heavy use, and have slopes of less than 15 percent.

Formation and Classification of Soils

In this section the factors that have affected the formation and composition of soils in Clay County are discussed. The soils are also placed in a scheme of classification.

Factors of Soil Formation

Soil is the product of the combined effects of parent material, climate, plant and animal life, relief, and time (*10*). The characteristics of a soil at any place depend upon a combination of these five environmental factors at the particular place. All of these factors affect the formation of every soil. In many places, however, one or two of the factors are dominant and fix most of the properties of a particular soil.

Parent material

Parent material, the unconsolidated mass from which a soil develops, is largely responsible for the chemical and mineral composition of a soil. The soils of Clay County formed mainly in sediments deposited in the Gulf of Mexico before the water receded from the Coastal Plain (*5*). This sediment consists of sands, silts, and clays. The geologic formations now at the surface are of Cretaceous and Paleocene age. In the eastern part of the county, Okolona, Brooksville, Kipling, and other soils formed in beds of acid and calcareous clays over thick beds of calcareous Selma chalk. In the southwestern part of the county, Ora, Pren-

[6] G. W. YEATES, staff conservationist, helped write this section.

TABLE 12.—*Soil limitations for recreational development*

["Depth to rock" and some of the other terms that describe restrictive soil features are defined in the Glossary. See text for definitions of terms used to rate soils]

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Belden: Be	Severe: floods; wetness	Severe: floods; wetness	Severe: floods; wetness	Moderate: floods; wetness.
Bigbee: Bg	Severe: floods; too sandy	Moderate: floods; too sandy.	Severe: floods; too sandy	Moderate: floods; too sandy.
Binnsville: BnB	Moderate: percs slowly; too clayey.	Moderate: too clayey	Severe: depth to rock	Moderate: too clayey.
Brooksville: BrA, BrB	Severe: percs slowly; wetness.	Moderate: too clayey; wetness.	Severe: percs slowly; too clayey; wetness.	Moderate: too clayey; wetness.
Cahaba: CaA	Slight	Slight	Slight	Slight.
Chalk outcrop: CoD.				
Chalk outcrop part	Severe: dusty	Severe: dusty	Severe: dusty	Severe: dusty.
Demopolis part	Moderate: too clayey; slope.	Moderate: too clayey; slope.	Severe: depth to rock	Moderate: too clayey.
Griffith: Gr	Severe: floods; percs slowly; too clayey.	Severe: floods; too clayey	Severe: floods; percs slowly; too clayey.	Severe: too clayey.
Kipling:				
KpA, KpB2	Moderate: percs slowly; wetness.	Moderate: wetness	Moderate: percs slowly; wetness.	Moderate: wetness.
KpC2	Moderate: percs slowly; wetness.	Moderate: wetness	Severe: slope	Moderate: wetness.
Leeper: Le	Severe: floods; percs slowly; wetness.	Severe: too clayey; floods; wetness.	Severe: floods; percs slowly; wetness.	Severe: too clayey; floods; wetness.
Longview: LoA, LoB	Moderate: percs slowly; wetness.	Moderate: wetness	Moderate: percs slowly; wetness.	Moderate: wetness.
Mathiston: Ma	Severe: floods; wetness	Moderate: floods; wetness	Severe: floods	Moderate: floods; wetness.
Mayhew: MhA	Severe: wetness; percs slowly.	Severe: wetness	Severe: wetness; percs slowly.	Severe: wetness.
Okolona: OkA, OkB	Severe: percs slowly; too clayey.	Severe: too clayey	Severe: percs slowly; too clayey.	Severe: too clayey.
Ora:				
OrB	Slight	Slight	Moderate: slope	Slight.
OrC2	Slight	Slight	Severe: slope	Slight.
OrD2	Moderate: slope	Moderate: slope	Severe: slope	Slight.
Ozan: Oz	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Prentiss:				
PrA	Slight	Slight	Slight	Slight.
PrB	Slight	Slight	Moderate: slope	Slight.
Ruston: RuC	Slight	Slight	Moderate: slope	Slight.
Sessum: Se	Severe: percs slowly; wetness; too clayey.	Severe: wetness; too clayey.	Severe: percs slowly; wetness; too clayey.	Severe: wetness; too clayey.
Smithdale: SRE.				
Smithdale part	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Ruston part	Slight	Slight	Moderate: slope	Slight.
Stough: StA	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness.
Sumter:				
SuB2	Severe: too clayey	Severe: too clayey	Severe: percs slowly; too clayey.	Severe: too clayey.
SuC2	Severe: too clayey	Severe: too clayey	Severe: slope; too clayey	Severe: too clayey.
Sweatman:				
SwC	Moderate: percs slowly; slope.	Moderate: slope	Severe: slope	Slight.
SXE:				
Sweatman part	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Smithdale part	Severe: slope	Severe: slope	Severe: slope	Moderate: slope.
Tippah: ThB	Moderate: percs slowly	Slight	Moderate: percs slowly; slope.	Slight.
Tuscumbia: TL.				
Tuscumbia part	Severe: wetness; floods; percs slowly.	Severe: wetness; floods	Severe: wetness; floods; percs slowly.	Severe: wetness; floods.
Leeper part	Severe: floods; percs slowly; wetness.	Severe: too clayey; floods; wetness.	Severe: floods; percs slowly; wetness.	Severe: too clayey; floods; wetness.

TABLE 12.—*Soil limitations for recreational development*—Continued

Soil series and map symbols	Camp areas	Picnic areas	Playgrounds	Paths and trails
Una: Un	Severe: wetness; floods; percs slowly.	Severe: wetness; floods; too clayey.	Severe: wetness; floods; percs slowly.	Severe: wetness; floods; too clayey.
Urbo: Ur	Severe: floods; wetness; percs slowly.	Moderate: wetness; floods, too clayey.	Severe: floods; percs slowly; wetness.	Moderate: wetness; floods; too clayey.
Wilcox: WcB, WcC, WcD	Severe: percs slowly	Moderate: wetness; slope; too clayey.	Severe: percs slowly	Moderate: wetness; too clayey.

tiss, and Stough soils formed in sediment consisting of noncalcareous sands, silts, and clays. In the western part of the county, a mantle of silt overlies the Porters Creek clay.

The soils along the larger streams in the county formed in alluvium, material transported and redeposited by streams. Much of the alluvium along Chuquatonchee, Houlka, and Tibbee Creeks originated from clayey material, but the alluvium along Prairie, Sand, Sun, and Underwood Creeks originated from loamy to sandy sediment.

The soils that formed in old alluvium on high stream terraces and benches have been in place long enough to have a well-defined profile. Along the drainageways throughout the county, some soils have been modified only slightly, if at all, by the soil-forming processes.

Climate

Climate as a genetic factor affects the physical, chemical, and biological relationships in the soil, mainly through the influence of precipitation and temperature. Water dissolves minerals and supports biological and organic residue and distributes them through the soil profile. Percolation of water helps distribute the weathering products in the soil or may remove them. The amount of water that actually percolates through the soil over a broad area depends mainly on the amount of rainfall, the relative humidity, and the length of the frost-free period. At a given point, the amount of downward percolation is also affected by physiographic position of the soil and by soil permeability.

Temperature influences the kind of organisms and their growth as well as the speed of physical and chemical reactions in the soil. These reactions are also influenced by the warm, moist weather that prevails most of the year. Water from the relatively high precipitation leaches clay particles and other soluble material downward. The mature soils in this county have been strongly leached, and leaching is progressing in the young soils.

In this county the soils are moist. During most of the year they are subject to leaching. Freezing and thawing have had little effect on weathering and soil-forming processes. The average maximum temperature is about 76.6° F., and the average minimum temperature is 52.8°. Rainfall is abundant, is slightly greater in spring and summer than in fall and winter, and averages about 51 inches each year.

Plant and animal life

Micro-organisms, plants, earthworms, and all other organisms that live on and in the soil have an important effect on its formation. Bacteria, fungi, and other micro-organisms aid in weathering the rock and decomposing the organic matter. The larger plants serve to alter the microclimate, to furnish organic matter, and to transfer elements from the subsoil to the surface soil. The kinds and numbers of plants and animals that live on and in the soil are determined mainly by the climate, but partly by parent material, relief, and age of the soil.

Not much is known of the fungi and other micro-organisms in the soils of this county, except that they are mostly in the topmost few inches of soil material. Earthworms and other small invertebrates are most active in the surface layer where they continually mix the soil. Mixing of soil material by rodents does not appear to have been of much consequence in this county.

In Clay County the native vegetation was forests of pine and hardwood trees and grass and hardwood trees. Vegetation in the pine-hardwood forest helped to produce soils that are low to medium in content of organic matter. In dry areas the soils have a lower content than those in moist sites. Pine, oak, elm, sweetgum, and hackberry trees are common on these dry sites. Water oak grew in the wetter places and cottonwood and willow in the overflow areas. The soils are somewhat higher in content of organic matter where the native vegetation was that of grass-hardwood forest.

Gains in organic matter and nitrogen in the soil, gains or losses in plant nutrients, and changes in structure and porosity are among the changes brought about by living organisms.

Relief

Relief is largely determined by the kind of geologic formation underlying an area, the geologic history of the general area, and the effects of dissection by rivers and streams. Relief influences the formation of soils through its effects in drainage, erosion, plant cover, soil temperature, and vegetation. This influence is modified by the other four factors of soil formation.

The slopes in Clay County range from 0 to 40 percent. On the uplands, the Ora, Prentiss, and Ruston soils have slopes of less than 12 percent and have a thick, well-defined profile.

Within a given length of time, on a given parent material and under the same kind of vegetation, the degree of profile development that takes place probably depends largely on the amount of water passing through the soil. The soils that show the greatest profile development occur in flat areas where the parent material is loamy, and permeability of the substratum is such that the excess ground water is carried off slowly. In some poorly drained and waterlogged areas, however, soils that have a strongly developed profile have formed.

Time

Generally a long time is required for formation of a soil that has distinct horizons. The differences in length of time that the parent material has been in place, therefore, are commonly reflected in the degree of development of the soil profile.

Examples of the younger soils are those of the Belden series. These soils have a weakly developed B horizon and formed in loamy material high in silt on flood plains. Examples of older soils that formed in alluvium are those of the Griffith series. The Griffith soils are clayey and have a weakly developed soil profile. Examples of older soils that formed on uplands are those of the Ruston series. Ruston soils are loamy and have distinct horizons.

Processes of Soil Horizon Differentiation

Several processes were involved in the formation of horizons in the soils of this county. These processes are accumulation of organic matter; leaching of calcium carbonates and bases; the liberation, reduction, and transfer of iron; and formation and translocation of silicate clay minerals. In most soils more than one of these processes have been active in the development of horizons.

The accumulation of organic matter in the upper part of the profile has been important in the formation of an A1 horizon. The soils of this county are mainly low to very low in content of organic matter.

Carbonates and bases have been leached from most of the soils. Soil scientists are generally agreed that leaching of bases from the upper horizons of a soil usually precedes translocation of silicate clay minerals. Most of the soils in this county are moderately to strongly leached, and this leaching has contributed to the development of horizons.

The reduction and transfer of iron, a process called gleying, is evident in the poorly drained Mayhew, Ozan, Tuscumbia, and Una soils of this county. The gray color in the subsoil horizons indicates the reduction and loss of iron. Some horizons contain yellowish-red or strong-brown mottles and concretions, which indicate a segregation of iron. Horizons of the Prentiss and Stough soils are examples.

In some of the soils of this county, the translocation of silicate clay minerals has contributed to the development of horizons. The illuviated A2 horizon is lower in content of clay and is generally lighter colored than the B horizon. In most places the B horizon contains accumulated clay or has clay films in pores and on the surface of peds. These soils were probably leached of carbonates and soluble salts to a considerable extent before translocation of silicate clays took place. The leaching of bases and the translocation of silicate clays are among the more important processes in the formation of different horizons in the soils of this county. Examples of soils that have translocated silicate clays in the B horizon in the form of clay films are those of the Ora, Smithdale, and Ruston series.

Classification of Soils

Classification is an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification helps organize and apply the results of experience and research.

Soils are placed in narrow classes for discussion in detailed soil surveys and for application of knowledge within farms and fields. The thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories, so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 (*2*) and revised later (*9*). The system currently used by the National Cooperative Soil Survey was developed in the early sixties and adopted in 1965. Supplements were issued in March 1967 and in September 1968. The system is under continual study (*8, 14*). Readers interested in the development of the system should refer to the latest literature available.

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 13 shows the classification of each soil series of the county by family, subgroup, and order, according to the current system.

ORDER. Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. The two exceptions are the Entisols and Histosols, which occur in many different climates.

The six orders represented in Clay County are Entisols, Vertisols, Inceptisols, Mollisols, Alfisols, and Ultisols. Entisols are recent soils. They are without genetic horizons, or have only the beginning of such horizons. In this county the order includes many of the soils that were previously classified as Alluvial soils and Regosols.

Vertisols are high in swelling and shrinking clays that crack in dry weather. Okolona and Brooksville are unstable soils high in content of montmorillontic clay, and are Vertisols.

Inceptisols most often occur on young, but not recent, land surfaces; hence, their name is derived from Latin *inceptum* for beginning. In this county the order includes soils that were formerly called Alluvial soils and some that were formerly known as Low-Humic Gley soils. Leeper and Urbo soils are in this order.

Mollisols have a dark-colored surface layer that is high in base saturation. Binnsville and Griffith soils are classified in this order.

Alfisols have a clay-enriched B horizon that is high in base saturation. In this county this order includes most of the soils that formerly were called Gray-Brown Podzolic soils and associated Alluvial soils. The Kipling soils are classified in this order.

Ultisols have a clay-enriched B horizon that has a base saturation of less than 35 percent, and that percentage decreases with depth. Many soils in Clay County are classified in this order. The Ora, Prentiss, Ruston, and Sweat-

TABLE 13.—*Classification of soil series*

Series	Family	Subgroup	Order
Belden	Fine-silty, mixed, nonacid, thermic	Aeric Fluvaquents	Entisols.
Bigbee	Thermic, coated	Typic Quartzipsamments	Entisols.
Binnsville	Clayey, mixed, thermic, shallow	Typic Rendolls	Mollisols.
Brooksville	Fine, montmorillonitic, thermic	Aquic Chromuderts	Vertisols.
Cahaba	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Demopolis	Loamy-skeletal, carbonatic, thermic, shallow	Typic Udorthents	Entisols.
Griffith	Fine, montmorillonitic, thermic	Vertic Haplaquolls	Mollisols.
Kipling	Fine, montmorillonitic, thermic	Vertic Hapludalfs	Alfisols.
Leeper	Fine, montmorillonitic, nonacid, thermic	Vertic Haplaquepts	Inceptisols.
Longview	Fine-silty, siliceous, thermic	Glossaquic Hapludalfs	Alfisols.
Mathiston	Fine-silty, siliceous, acid, thermic	Aeric Fluvaquents	Entisols.
Mayhew	Fine, montmorillonitic, thermic	Vertic Ochraqualfs	Alfisols.
Okolona	Fine, montmorillonitic, thermic	Typic Chromuderts	Vertisols.
Ora	Fine-loamy, siliceous, thermic	Typic Fragiudults	Ultisols.
Ozan	Coarse-loamy, siliceous, thermic	Typic Glossaqualfs	Alfisols.
Prentiss	Coarse-loamy, siliceous, thermic	Glossic Fragiudults	Ultisols.
Ruston	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Sessum	Fine, montmorillonitic, thermic	Vertic Ochraqualfs	Alfisols.
Smithdale	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Stough	Coarse-loamy, siliceous, thermic	Fragiaquic Paleudults	Ultisols.
Sumter	Fine-silty, carbonatic, thermic	Rendollic Eutrochrepts	Inceptisols.
Sweatman	Clayey, mixed, thermic	Typic Hapludults	Ultisols.
Tippah	Fine-silty, mixed, thermic	Aquic Paleudalfs	Alfisols.
Tuscumbia	Fine, mixed, nonacid, thermic	Vertic Haplaquepts	Inceptisols.
Una	Fine, mixed, acid, thermic	Typic Haplaquepts	Inceptisols.
Urbo	Fine, mixed, acid, thermic	Aeric Haplaquepts	Inceptisols.
Wilcox	Fine, montmorillonitic, thermic	Vertic Hapludalfs	Alfisols.

man soils are examples of Ultisols.

SUBORDER. Each order is divided into suborders, primarily on the basis of those soil characteristics that seem to produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the order. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging, or soil differences resulting from the climate or vegetation.

GREAT GROUP. Soil suborders are divided into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated or those that have pans that interfere with the growth of roots or the movement of water. The features used are the self-mulching properties of clay, soil temperature, major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium), and the like.

SUBGROUPS. Great groups are divided into subgroups, one representing the central (typic) segment of the group and others, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties intergrade outside of the range of another great group, subgroup, or order.

FAMILY. Families are established within each subgroup primarily on the basis of properties that affect the growth of plants or the behavior of soils in engineering uses. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, thickness of horizons, and consistence.

SERIES. The series is a group of soils having major horizons that, except for the texture of the surface layer, are similar in important characteristics and arrangement in the profile. The soil series generally is given the name of a geographic location near the place where a soil of that series was first observed and mapped.

Chemical Properties of Soils [7]

The surfaces of clay and organic particles in soils are negatively charged. These charges are neutralized by relatively weakly bonded cations, called exchangeable cations because of the ease with which they may be replaced by other cations in the soil solution. Cation exchange is the name given to this process of replacing one cation on the clay or organic surface by another cation. It is sometimes called the second most important process in nature, being surpassed only by photosynthesis. The tremendous significance of this process can be appreciated if one realizes that the nutrient cations are held on the exchange surfaces in a form available to plants, yet their loss by leaching is retarded.

The quantity of cations held in the exchangeable form is called the cation exchange capacity (CEC). The cation exchange capacity may be determined directly by measuring the maximum absorption of a test cation or by summation of the individual exchangeable cations occurring naturally in the soil. The latter method was used to obtain the data in this report. The content of extractable cations and the CEC are expressed in milliequivalents (meq) per 100 grams of oven-dry soil. It is often desirable to convert meq/100 g of the different cations to the more practical units of pounds

[7] By V. E. NASH, agronomist, Department of Agronomy, Mississippi Agricultural and Forestry Experiment Station, Mississippi State University, Mississippi State, Mississippi.

per acre plow layer (6⅔ inches deep). For this purpose the following conversions may be helpful:

meq. calcium (Ca)/100 g × 400 = pounds per acre of Ca
meq. magnesium (Mg)/100 g × 240 = pounds per acre of Mg
meq. potassium (K)/100 g × 780 = pounds per acre of K
meq. sodium (Na)/100 g × 460 = pounds per acre of Na
meq. hydrogen (H)/100 g × 20 = pounds per acre of H
meq. aluminum (Al)/100 g × 180 = pounds per acre of Al

It is also useful to remember that 1 meq/100 g of extractable acidity (H + Al) requires 1,000 pounds of calcium carbonate lime per acre to neutralize it.

The soil analyses reported in tables 14 and 15 were made in the Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station. The procedures used were essentially like those given in the Soil Survey Investigation Report No. 1 (SSIR 1) (*18*).

Soil samples were collected from open pits by the soil scientist. Preparation of the samples for analyses at the laboratory consisted of air drying, grinding, and screening through a No. 10 sieve.

The exchangeable cations, calcium, magnesium, potassium, and sodium were extracted by neutral, normal ammonium acetate (NH_4OAc) (method 5A1 of SSIR 1). Calcium and magnesium in the extract were determined with a Perkin-Elmer atomic absorption apparatus using strontium chloride ($SrCl_2$) to suppress interference of aluminum, silicon, and phosphorus. Potassium and sodium were analyzed by flamephotometry using a Beckman flame spectrophotometer. Extractable acidity (hydrogen + aluminum) was extracted with barium chloride-triethanolamine buffered to pH 8.2.

The percentage of base saturation was calculated by dividing the sum of the bases (calcium, magnesium, sodi-

TABLE 14.—*Particle-size distribution in selected soils*

[Analyzed by Soil Genesis and Morphology Laboratory of the Mississippi Agricultural and Forestry Experiment Station]

Soil series	Horizon	Depth from surface	Particle-size distribution		Total sand (2.0 to 0.05 mm)
			Total clay (0.002 mm)	Total silt (0.05 to 0.002 mm)	
		Inches			
Bigbee	Ap	0-8	6.0	7.5	86.5
	C1	8-17	6.8	6.0	87.2
	C2	17-32	0.2	5.3	94.5
	C3	32-80	0.2	3.0	96.8
Kipling	Ap	0-4	27.4	51.1	21.5
	B21t	4-8	46.6	44.4	9.0
	B22t	8 14	48.0	42.7	9.3
	B23t	14-22	46.3	42.8	10.9
	B24t	22-37	42.1	47.0	10.9
	B25t	37-50	48.2	42.2	9.6
	C1	50-58	56.0	35.6	8.4
	C2	58-68	60.9	31.8	7.3
Longview	A	0-8	10.1	61.9	28.0
	B21t	8-16	14.7	62.5	22.8
	B22t	16-21	16.5	58.8	24.7
	B23t&A'2	21-32	19.1	57.3	23.6
	B24t	32-51	23.1	56.2	20.7
	B25t	51-62	28.4	51.5	20.1
	B26t	62-80	27.7	48.7	23.6
Ozan	Ap	0-7	6.3	34.4	59.3
	A21g&B21tg	7-19	10.1	36.1	53.8
	B22tg&A22g	19-37	15.2	35.3	49.5
	B23tg	37-58	26.2	36.1	37.7
	B24tg	58-80	28.3	22.4	49.3
Ruston	Ap	0-7	0.5	36.6	62.9
	B21t	7-19	21.6	34.0	44.4
	B22t	19-38	15.2	34.7	50.1
	B23t&A'2	38-58	17.7	8.7	73.6
	B'24t	58-88	22.2	9.9	67.9
Sessum	Ap	0-4	42.0	40.0	18.0
	B21t	4-8	52.7	33.1	14.2
	B22t	8-13	59.1	29.9	11.0
	B23t	13-20	56.6	31.2	12.2
	B24t	20-44	54.4	33.1	12.5
	Cg	44-62	50.0	37.5	12.5
Stough	Ap	0-5	3.8	44.3	51.9
	B21t	5-15	8.8	43.0	48.2
	B22t	15-26	7.5	48.2	44.3
	B23t	26-35	7.5	46.6	45.9
	B24t	35-57	9.3	46.9	43.8

um, and potassium) by the sum of the cations and multiplying by 100. The sum of the cations include in addition to the bases the extractable acidity (H + Al) (hydrogen + aluminum).

Soil pH was determined potentiometrically with a Coleman pH meter using a 1:1 soil:water ratio.

The cation exchange capacity is not only a measure of the soil's ability to hold nutrient cations in an available form, but also gives clues as to the type of clays present. For example, montmorillonite has a CEC of 80-120 meq/100 g and is the only high-CEC mineral present in several of the soils. It is notorious for its high shrink-swell potential. If one assumes that most of he CEC is in the clay fraction, it is apparent that the CEC of the clay in the Kipling and Sessum soils is 60-70 meq/100 g. This suggests that a considerable proportion of the clay fraction is montmorillonite in the clay. These soils were formed from thin layers of acid clays over calcareous clay in the Blackland Prairie region. Similar soils in adjacent Monroe and Oktibbeha Counties were shown by x-ray analyses to contain about 50 percent montmorillonite. The high shrink-swell potential of these soils also suggests the presence of montmorillonite. The other soils reported have low CEC values as would be expected from the low percentage of clay. Also, similar soils in adjacent counties have been found to be low in montmorillonite.

Calcium is the dominant basic exchangeable cation in these soils, particularly the deeper horizons of soils like Kipling and Sessum. The Ozan and Longview soils of the Flatwoods Region also show a marked increase in calcium in the deepest zone. The high content of calcium in the Ap horizons of several soils is, no doubt, the result of liming. Magnesium saturation of these soils is in the range of 5 to 10 percent, which is low for balanced plant nutrition. This low content is due to the low magnesium in the parent material as well as to intensive weathering of these soils. Only the Ruston soil had a calcium/magnesium ratio of less than 1. In this highly leached acid soil the calcium minerals have been removed and some magnesium is being released from the clay minerals. Exchangeable potassium is also low, in most places less than 0.1 meq/100 g, 78 pounds per acre, except where fertilizer has been applied. Kipling and Sessum soils appear to have higher amounts in the subsoil, but these are still less than 1 percent saturation.

The soils analyzed from Clay County are all acid as shown by the low pH, high extractable acidity, and low base saturation. Liming has raised base saturation and pH in the surface horizons of the Kipling, Ozan, Longview, and Sessum soils. Only the Sessum and Bigbee series have base saturations greater than 35 percent in the subsoil. This high acidity is another indication of intensively weathered soils.

The Comprehensive Soil Classification Systems adopted by the National Cooperative Soil Survey make use of chemical soil properties as differentiating criteria in separating some categories of the system. Alfisols and Ultisols, which are classes in the highest category in the system, are separated on the basis of percentage base saturation deep in the subsoil. The argillic horizons of the Ultisols have base saturations of less than 35 percent, whereas those of the Alfisols have values greater than 35 percent. In the soils reported here, Ruston soils, having 22 percent base saturation, is in the order Ultisols, and Sessum soils, having 46 percent, is in the order Alfisols. The degree of weathering is a measure of the extent of the replacement of bases by hydrogen during the leaching process. Usually the calcium/magnesium ratio decreases with degree of weathering, and this is well demonstrated in the case of the well-developed Ruston soil.

Particle-size analyses

The particle-size analyses of these soils were obtained by using the hydrometer method of Day (*4*). Forty grams of soil were dispersed in a 0.5 percent Calgon solution ($NaPO_3$) by mixing them for 5 minutes in a milk shaker. The dispersed soil was transferred to a sedimentation cylinder, made to 1,000 ml, and equilibrated overnight in a 30° C water bath. The suspension was then mixed and allowed to settle. Hydrometer readings were taken at predetermined times to determine the clay content. The sand was separated on a 325 mesh sieve, dried, and weighed. All results are expressed on the basis of 110° C oven-dry weight.

The physical properties of soils, such as water infiltration and conduction, shrink-swell potential, crusting, ease of tillage, consistence, and available water capacity, are closely related to soil texture (*i.e.*, the percentage of sand, silt, and clay).

The Kipling and Sessum soils from the region are high in expansible montmorillonite clay. This causes shrinking and swelling during drying and wetting cycles and makes these soils very unstable as foundations for buildings and roads. Cracks which develop during dry weather sometimes damage plant roots. Water infiltration is rapid until the cracks swell closed, and then infiltration and hydraulic conductivity are very slow. The plastic nature of these soils makes it necessary to exercise care in working these soils. If the soil is too wet during plowing or cultivation, hard, dense clods will result.

The Longview soil has a high silt content, which may result in adverse physical conditions. Often these soils pack excessively. A surface crust formed by raindrops may result in poor seedling germination and emergence. A plowpan also develops easily during tillage operations.

The surface horizons of the remaining soils that were analyzed are loamy sands or sandy loams. These soils should allow good infiltration and movement of water through the soil. Tillage operations on such soils require less power than operations on clayey soils, and the moisture content at the time of tillage is not so critical. Some problems with these sandy soils are the low available water capacity and nutrient absorption capacity.

General Nature of the County

This section provides information about the history; physiography, relief, and drainage; and climate of Clay County.

History

Clay County was created by act of legislature in 1871. It was formed from parts of Webster, Chickasaw, Monroe, and Oktibbeha Counties. It was first called Colfax County.

West Point, the county seat, is the only incorporated

TABLE 15.—*Chemical analysis*

[Analyzed by the Soil Genesis and Morphology Laboratory of the Mississippi

Soil series	Horizon	Depth from surface	Reaction 1:1 H_2O	Extractable cations Meq per 100 grams
				Calcium
		Inches		
Bigbee	Ap	0-8	5.5	2.1
	C1	8-17	5.5	2.6
	C2	17-32	5.4	1.0
	C3	32-80	5.4	0.8
Kipling	Ap	0-4	5.5	17.8
	B21t	4-8	4.7	5.6
	B22t	8-14	4.8	5.8
	B23t	14-22	4.8	6.3
	B24t	22-37	4.7	6.0
	B25t	37-50	4.6	11.4
	C1	50-58	5.2	21.0
	C2	58-68	6.7	30.6
Longview	A	0-8	6.8	9.4
	B21t	8-16	4.7	1.7
	B22t	16-21	4.8	0.8
	B23t&A'2	21-32	4.8	1.3
	B24t	32-51	5.2	3.7
	B25t	51-62	5.1	5.8
	B26t	62-80	5.1	6.8
Ozan	Ap	0-7	5.9	2.6
	A21g&B21tg	7-19	5.2	1.8
	B22tg&A22g	19-37	5.0	1.4
	B23tg	37-58	5.4	6.8
	B24tg	58-80	5.5	14.5
Ruston	Ap	0-7	5.5	0.4
	B21t	7-19	5.2	0.3
	B22t	19-38	5.3	0.2
	B23t&A'2	38-58	5.5	0.8
	B'24t	58-88	5.3	0.3
Sessum	Ap	0-4	7.0	29.6
	B21t	4-8	7.2	28.0
	B22t	8-13	4.6	15.1
	B23t	13-20	4.5	17.5
	B24t	20-44		20.6
	Cg	44-62		21.8
Stough	Ap	0-5	5.1	1.2
	B21t	5-15	5.0	0.2
	B22t	15-26	4.9	0.2
	B23t	26-35	4.9	0.4
	B24t	35-57	5.0	0.6

town in the county. Other smaller villages are Cedar Bluff, Montpelier, Pheba, and Tibbee.

The population has declined since World War II. The decrease is mainly because of people leaving the farm and moving to cities in other states.

The county is mainly agricultural, but it is also the location for several industries. The industries include garment factories, sawmills, a fertilizer plant, a meat packing plant, a boat factory, a casket factory, a toy factory, and a boiler factory.

Transportation facilities in the county are good. The Illinois Central Railroad serves the county with through lines. One line runs north and south through West Point. Another line runs from south to northeast through West Point. A third line crosses from east to west in the southern part of the county. The county is traversed north and south by U.S. Highway 45 and east and west by Mississippi Highway 50. Mississippi Highways 46 and 47 run in a northwesterly-southeasterly direction in the western part of the county. The Natchez Trace Parkway crosses the northwestern corner of the county.

Physiography, Relief, and Drainage

Clay County lies wholly within the southern Coastal Plain province. Most of the county, all but the extreme eastern and western parts, lies within the Black Prairie belt developed from upper cretaceous chalks (*3*). The eastern 2 or 3 miles adjacent to the Tombigbee River is composed of ferruginous red sandy hills of the Eutaw Formation. In the extreme western part of the county, a gently undulating to slightly wooded plain known as the flatwoods has been developed on the calcareous and micaceous Porters Creek clay. This belt is 4 or 5 miles wide and extends laterally into Webster County.

An extension of the Pontotoc Hills forms a belt that is 3 to 5 miles in width between the flatwoods and the prairie

of selected soils

Agricultural and Forestry Experiment Station. Dashes indicate trace amounts]

Extractable cations Meq per 100 grams—*Continued*					Base saturation by sum of cations
Magnesium	Potassium	Sodium	Extractable acidity	Sum of cations	*Percent*
0.3	0.1	—	3.1	5.6	44.6
0.4	0.1	—	2.4	5.5	55.3
0.3	0.1	—	2.3	3.7	37.4
0.3	0.1	—	2.3	3.5	33.9
1.9	0.7	0.1	11.5	32.0	64.0
0.7	0.3	0.1	22.2	28.9	23.1
0.7	0.3	0.1	21.7	28.6	24.1
0.7	0.3	0.2	19.7	27.2	27.5
0.5	0.2	0.2	20.5	27.4	25.3
0.6	0.3	0.4	20.0	32.7	38.7
1.1	0.2	0.8	14.7	37.8	61.0
1.5	0.3	1.3	10.4	44.1	76.3
0.5	0.1	—	4.4	14.4	68.9
0.4	0.1	—	9.2	11.4	18.7
0.3	0.1	0.1	12.1	13.4	9.3
0.4	0.1	0.1	13.2	15.1	12.5
0.3	0.1	0.6	11.7	16.4	29.0
1.3	0.2	0.9	13.9	22.1	37.1
1.6	0.2	0.9	9.8	19.3	48.9
0.1	—	0.1	3.1	5.9	47.0
0.1	—	0.1	4.3	6.3	31.0
0.1	0.1	0.2	7.4	9.2	19.0
0.7	0.2	0.6	12.4	20.7	40.0
1.4	0.2	0.8	3.7	20.6	82.0
0.1	0.1	—	2.6	3.2	18.4
1.2	0.5	0.1	7.8	9.9	21.6
0.8	0.4	0.1	6.7	8.2	18.3
1.4	0.4	0.1	6.4	9.1	28.9
0.8	0.2	0.1	5.9	7.3	18.5
2.9	1.4	0.1	4.7	38.7	87.8
3.7	1.4	0.5	5.5	39.1	85.7
2.3	0.6	0.2	23.3	41.5	43.6
2.6	0.3	0.5	21.9	42.8	48.8
2.9	0.3	0.9	17.3	42.0	58.7
3.6	0.3	1.6	8.1	35.4	77.0
0.1	0.1	0.1	3.1	4.6	34.0
0.1	0.1	0.1	2.7	3.2	15.0
0.1	0.1	0.1	4.4	4.9	9.0
0.1	0.1	0.2	2.9	3.7	22.0
0.1	0.1	0.2	5.6	6.6	16.0

lands. Though this belt is composed mainly of Ripley sands and clays, some Prairie Bluff Chalk and basal Midway materials form the western part. The hills rise gently 50 to 60 feet above the valleys on the western side but are steeper on the east where the valleys are narrower. Altitudes are about 350 feet in the southern part of the belt in the portion known as the Kilgore Hills and about 100 feet higher in the northern part. Erosion has formed deep gullies in the Red Sand Formation, producing lands of poor agricultural value.

Extensive prairie areas have been developed from Selma Chalk. In the eastern part, a silty dark-brown to black calcareous residual soil has formed on the lower Selma Chalk and the lower part of what is termed the Demopolis, or upper division. In the west-central part of the county, the regolith is thin, and vast, bald white areas are conspicuous on the prairie lands of the Demopolis.

Broad alluvial bottom lands of high fertility border the streams. Extensive remnants of Pleistocene terraces form low hills and ridges north of Tibbee and Line Creeks, and lesser deposits lie along Chuquatonchee Creek.

Drainage is southeasterly into the Tombigbee River from Chuquatonchee Creek and Tibbee, Line, and Houlka Creeks and their tributaries. To this system of drainage, several canals have been added in the north-central and western parts of the county, where drainage projects have been started to enhance the agricultural value of the lowland areas and lessen the damage of overflows. In the northwestern part of the county, a small northwest-southeast divide controls the drainage of the tributaries of Line Creek and Chuquatonchee Creek.

Climate

Clay County has a warm humid climate that is influenced by the subtropical latitude, the high land mass to the

north, and the warm waters of the Gulf of Mexico some distance to the south. Local modifications are caused by variations in the topography.

Temperatures range from an average of about 46.4° F in January to an average of about 81.4° in July. Rainfall averages about 50.83 inches per year. Table 16 shows data on temperature and precipitation at Mississippi State University, Mississippi. (Data taken from records kept by the Agricultural Engineering Department, Mississippi State University.)

The temperature falls to 32° on an average of 50 days in the winter and rises to 90° or higher on an average of 90 days in the summer. The lowest temperature ever recorded was -8° in February 1899. The highest temperature was 111°.

The latest frost recorded in spring occurred on March 30, and the earliest in fall occurred on October 30. The average date of the last killing frost in spring is March 25, and the average first date in fall is November 6. The average frost-free period is 226 days (*11*).

If the sky is clear and the air is calm, frost can form near the ground at night and adversely affect seeds and young plants, even though the temperature registered on a thermometer in a shelter 5 feet above the ground is higher than 32°. On cold, windy nights, the temperature on hilltops is the same as, or lower than, it is in the valleys. On clear, calm nights, the temperature is likely to be considerably lower in the valleys and in open country than it is on the hilltops.

Winter and spring are the wettest seasons; fall is the driest. Dry weather in fall is especially beneficial to harvesting operations and to the planting of winter grain. In an unusually dry fall, germination of grain is hindered at times or planting is delayed too long. Rains in winter and spring may last for several days, but they normally occur as brief showers along the leading edge of a mass of cold air. Rains in summer come as local thundershowers that may bypass one area for days and even weeks and bring to another area enough moisture for crops. Dry weather and plentiful sunshine during the summer are especially beneficial to cotton.

TABLE 16.—*Temperature and precipitation*

[Data from records kept at Mississippi State, Mississippi. Temperature data for period 1910-62. Precipitation data for period 1889-1962]

Month	Temperature			Average precipitation
	Average	Average maximum	Average minimum	
	°F	*°F*	*°F*	*Inches*
January	46.4	56.8	36.1	5.15
February	49.5	60.6	38.5	4.93
March	55.5	66.9	44.1	6.16
April	63.8	75.6	51.9	4.56
May	71.4	83.3	60.0	4.04
June	79.1	90.5	67.6	3.96
July	81.4	92.5	70.3	4.74
August	80.9	92.3	69.5	3.53
September	76.1	88.1	64.2	2.68
October	65.7	78.3	53.2	2.51
November	54.0	65.7	42.3	3.61
December	47.3	57.5	37.0	4.96
Year				50.83

The wettest year recorded was 1912, when 76.27 inches of rain fell. The driest year was 1952, which had a total rainfall of 31.32 inches. The wettest month was July 1940, when 16.00 inches of rain was recorded. October is normally the driest month of the year, and March is normally the wettest.

Snow is of little economic importance in most years. On February 13, 1960, about 14 inches of snow fell, the heaviest snowfall ever recorded in the area. When snow does fall, it seldom remains on the ground for any considerable length of time, and occasionally no measurable amount is reported during an entire year.

Relative humidity is high both in winter and summer. It is 80 percent or higher 36 percent of the time in which the temperature is below 50° F. It never exceeds 79 percent when the temperature is 90° or higher, but it ranges from 50 to 79 percent 26 percent of the time when the temperature is 90° or higher. The relative humidity is less than 50 percent about three-fourths of the time that the temperature is 90° or higher.

Records from 1875 to 1959 indicate that tropical storms and hurricanes have never caused winds of gale or hurricane force, although heavy rains as a result of these storms have caused floods and have ruined unharvested crops. Records indicate that on the average there are two to four tornadoes about every 40 years.

Information in this section is taken from records kept at Mississippi State University in adjacent Oktibbeha County. This information is considered to be representative of the climate in Clay County.

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Glossary

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as crumbs, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount of wilting point. It is commonly expressed as inches of water per inch of soil.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Buried soil. A developed soil, once exposed but now overlain by more recently formed soil.

Calcareous soil. A soil containing enough calcium carbonate (often with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coat, clay skin.

Complex slope. Short and irregular slopes. Planning and construction of terraces, diversions, and other water-control measures are difficult.

Compressible. The soil is relatively soft and decreases excessively in volume when a load is applied.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds, or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Corrosive. The soil has high potential for causing uncoated steel to corrode or concrete to deteriorate.

Cutbanks cave. Walls of cuts are not stable. The soil sloughs easily.

Depth to rock. Bedrock is so near the surface that it affects specified use of the soil.

Contour farming. Plowing, cultivating, planting, and harvesting in rows that are at right angles to the natural direction of the slope or that are parallel to terrace grade.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low available water capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Decreaser. Any of the climax range plants most heavily grazed. Because they are the most palatable, they are first to be destroyed by overgrazing.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Excess fines. The soil contains too much silt and clay for use as gravel or sand in construction.

Excess lime. The amount of carbonates in the soil is so high that it restricts the growth of some plants.

Fast intake. Water infiltrates rapidly into the soil.

Favorable. Features of the soil are favorable for the intended use.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Genesis, soil. The manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that are responsible for the development of the solum, or true soil, from the unconsolidated parent material, as conditioned by relief and age of landform.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, and covered by grass for protection against erosion; used to conduct surface water away from cropland.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rains. The distinction between gully and rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by normal tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage. V-shaped gullies result if the material is more difficult to erode with depth; whereas U-shaped gullies result if the lower material is more easily eroded than that above it.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The

horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Leached soil. A soil from which most of the soluble materials have been removed from the entire profile or have been removed from one part of the profile and have accumulated in another part.

Low strength. The soil has inadequate strength to support loads.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast *faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Percs slowly. Water moves through the soil slowly, affecting the specified use.

Permeability. The quality that enable the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Phase, soil. A subdivision of a soil, series, or other unit in the soil classification system made because of differences in the soil that affect its management but do not affect its classification in the natural landscape. A soil series, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects its management but not its behavior in the natural landscape.

Piping. The soil is susceptible to the formation of pits caused by the melting of ground ice when the plant cover is removed.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Rooting depth. A layer that greatly restricts the downward rooting of plants occurs at a shallow depth.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Seepage. Water moves through the soil so quickly that it affects the specified use.

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Shrink-swell. The soil expands on wetting and shrinks on drying, which may cause damage to roads, dams, building foundations, or other structures.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on relatively steep slopes and in swelling clays, where there is marked change in moisture content.

Slow intake. Water infiltrates slowly into the soil.

Slow refill. Ponds fill slowly because the permeability of the soil is restricted.

Small stones. Rock fragments that are less than 10 inches across may affect the specified use.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles) adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Surface layer. A term used in nontechnical soil descriptions for one or more layers above the subsoil. Includes A horizon and part of B horizon; has no depth limit.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Terrace (geological). An old alluvial plain, ordinarily flat or undulating, bordering a river, lake, or the sea. Stream terraces are frequently called second bottoms, as contrasted to flood plains, and are seldom subject to overflow. Marine terraces were deposited by the sea and are generally wide.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer. Suitable soil material is not thick enough for use as borrow material or topsoil.

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Unstable fill. Banks of fill are likely to cave in or slough.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. For general information about management, read both the description of the mapping unit and the section "Use and Management of the Soils" beginning on page 25. The capability classification is described on pages 26 through 28. For information on use of soils for woodland, see the section beginning on page 28.

Map symbol	Mapping unit	Page	Capability unit Symbol	Woodland group Number
Be	Belden silt loam	6	IIw-6	1w8
Bg	Bigbee loamy sand	6	IIIs-1	2s2
BnB	Binnsville silty clay loam, 2 to 6 percent slopes	7	VIe-1	4d3c
BrA	Brooksville silty clay, 0 to 1 percent slopes	7	IIw-4	4c2c
BrB	Brooksville silty clay, 1 to 3 percent slopes	8	IIe-1	4c2c
CaA	Cahaba sandy loam, 0 to 2 percent slopes	8	I-1	2o7
CoD	Chalk outcrop-Demopolis complex, 5 to 15 percent slopes	8	VIe-2	---
Gr	Griffith silty clay	10	IIw-5	1w6
KpA	Kipling silt loam, 0 to 2 percent slopes	12	IIw-4	2c8
KpB2	Kipling silt loam, 2 to 5 percent slopes, eroded	12	IIIe-3	2c8
KpC2	Kipling silt loam, 5 to 8 percent slopes, eroded	12	IVe-1	2c8
Le	Leeper silty clay loam	13	IIw-1	1w6
LoA	Longview silt loam, 0 to 2 percent slopes	13	IIw-3	2w8
LoB	Longview silt loam, 2 to 5 percent slopes	13	IIe-3	2w8
Ma	Mathiston silt loam	14	IIw-6	1w8
MhA	Mayhew silt loam, 0 to 2 percent slopes	15	IIIw-1	2w9
OkA	Okolona silty clay, 0 to 1 percent slopes	15	IIs-1	4c2c
OkB	Okolona silty clay, 1 to 3 percent slopes	15	IIe-2	4c2c
OrB	Ora loam, 2 to 5 percent slopes	16	IIe-5	3o7
OrC2	Ora loam, 5 to 8 percent slopes, eroded	17	IIIe-4	3o7
OrD2	Ora loam, 8 to 12 percent slopes, eroded	17	IVe-2	3o7
Oz	Ozan sandy loam	17	IIIw-2	2w9
PrA	Prentiss sandy loam, 0 to 2 percent slopes	18	IIw-2	2o7
PrB	Prentiss sandy loam, 2 to 5 percent slopes	18	IIe-5	2o7
RuC	Ruston fine sandy loam, 5 to 8 percent slopes	19	IIIe-1	3o1
Se	Sessum silty clay	20	IVw-2	3c8
SRE	Smithdale-Ruston association, hilly	20	VIIe-1	3o1
StA	Stough sandy loam, 0 to 2 percent slopes	21	IIw-3	2w8
SuB2	Sumter silty clay, 2 to 5 percent slopes, eroded	21	IIIe-2	4c2c
SuC2	Sumter silty clay, 5 to 12 percent slopes, eroded	22	VIe-3	4c2c
SwC	Sweatman fine sandy loam, 5 to 12 percent slopes	22	VIe-4	3c2
SXE	Sweatman-Smithdale association, hilly	22	VIIe-1	---
	Sweatman part	--	-----	3c2
	Smithdale part	--	-----	3o1
ThB	Tippah silt loam, 2 to 5 percent slopes	23	IIe-4	3o7
TL	Tuscumbia-Leeper association, frequently flooded	23	-----	---
	Tuscumbia part	--	Vw-1	2w6
	Leeper part	--	IVw-1	1w6
Un	Una clay loam	24	IIIw-3	2w6
Ur	Urbo silty clay loam	24	IIw-5	1w8
WcB	Wilcox silt loam, 2 to 5 percent slopes	25	IIIe-5	3c2
WcC	Wilcox silt loam, 5 to 8 percent slopes	25	IVe-1	3c2
WcD	Wilcox silt loam, 8 to 17 percent slopes	25	VIe-4	3c3

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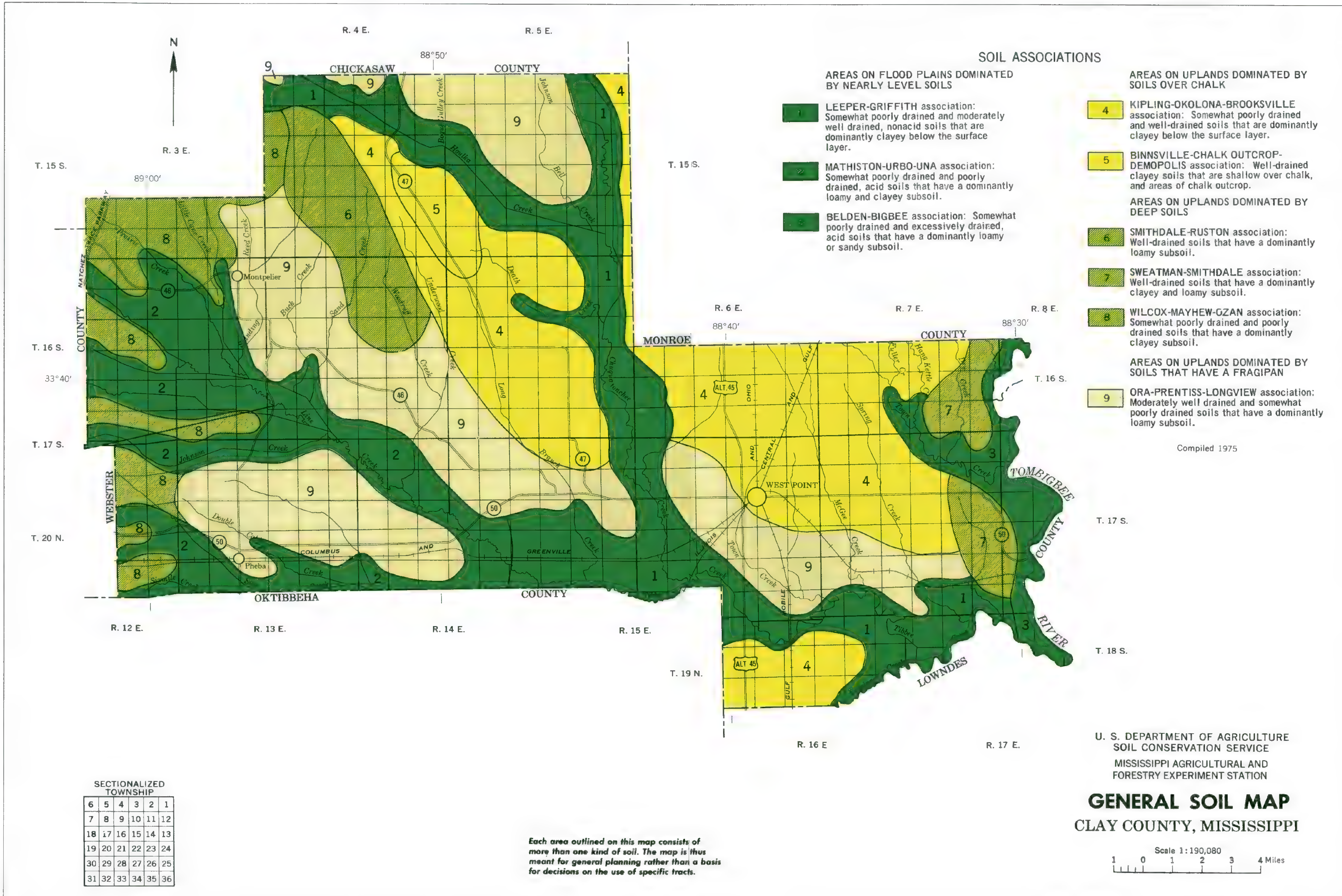
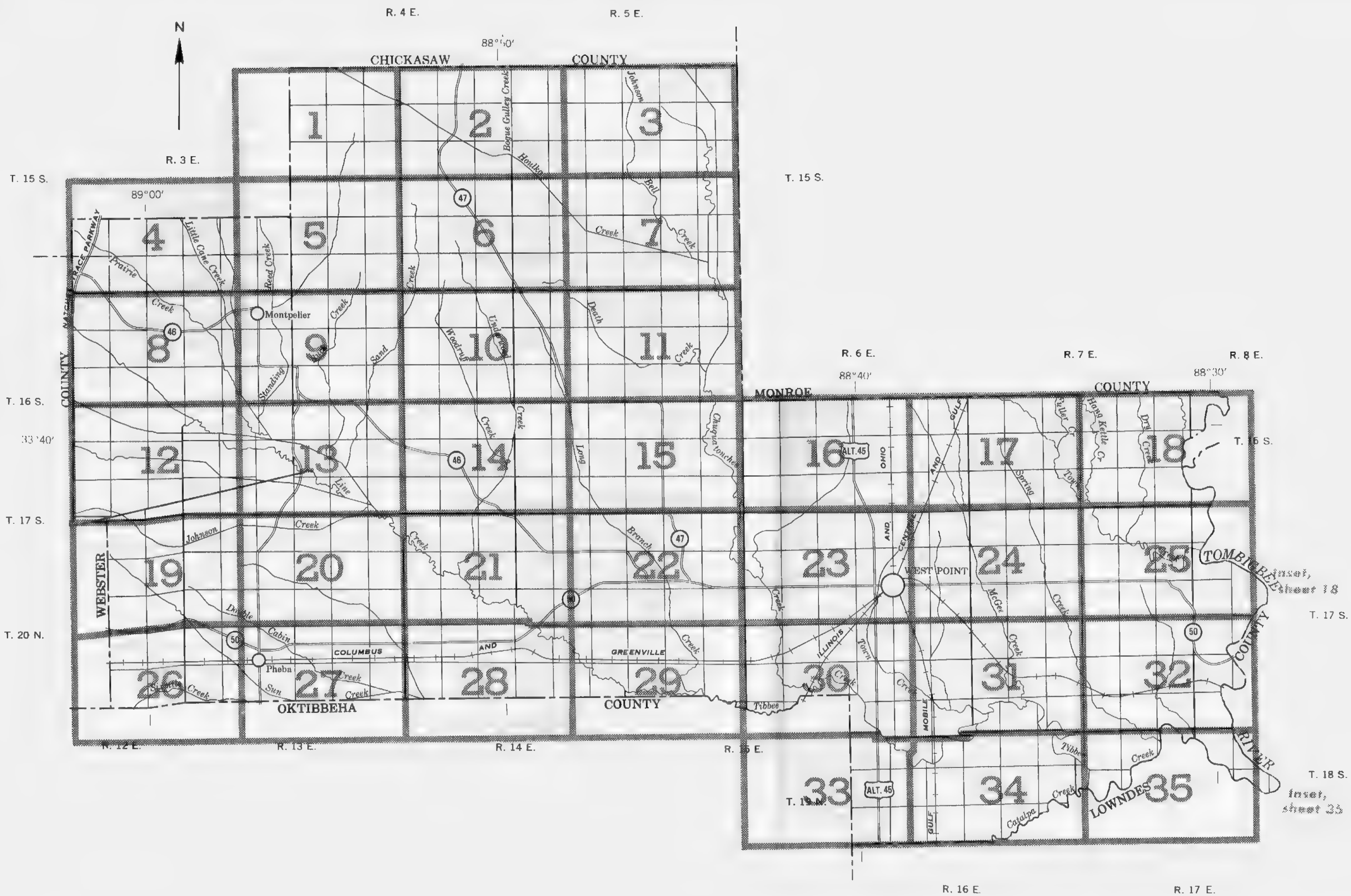


SOIL ASSOCIATIONS
AREAS ON FLOOD PLAINS DOMINATED BY NEARLY LEVEL SOILS
1 LEEPER-GRIFFITH association: Somewhat poorly drained and moderately well drained, nonacid soils that are dominantly clayey below the surface layer.
2 MATHISTON-URBO-UNA association: Somewhat poorly drained and poorly drained, acid soils that have a dominantly loamy and clayey subsoil.
3 BELDEN-BIGBEE association: Somewhat poorly drained and excessively drained, acid soils that have a dominantly loamy or sandy subsoil.
AREAS ON UPLANDS DOMINATED BY SOILS OVER CHALK
4 KIPLING-OKOLONA-BROOKSVILLE association: Somewhat poorly drained and well-drained soils that are dominantly clayey below the surface layer.
5 BINNSVILLE-CHALK OUTCROP-DEMOPOLIS association: Well-drained clayey soils that are shallow over chalk, and areas of chalk outcrop.
AREAS ON UPLANDS DOMINATED BY DEEP SOILS
6 SMITHDALE-RUSTON association: Well-drained soils that have a dominantly loamy subsoil.
7 SWEATMAN-SMITHDALE association: Well-drained soils that have a dominantly clayey and loamy subsoil.
8 WILCOX-MAYHEW-GOZAN association: Somewhat poorly drained and poorly drained soils that have a dominantly clayey subsoil.
AREAS ON UPLANDS DOMINATED BY SOILS THAT HAVE A FRAGIPAN
9 ORA-PRENTISS-LONGVIEW association: Moderately well drained and somewhat poorly drained soils that have a dominantly loamy subsoil.
Compiled 1975
N
R. 3 E.
R. 4 E.
R. 5 E.
R. 6 E.
R. 7 E.
R. 8 E.
R. 12 E.
R. 13 E.
R. 14 E.
R. 15 E.
R. 16 E
R. 17 E.
T. 15 S.
T. 16 S.
T. 17 S.
T. 18 S.
T. 19 N.
T. 20 N.
89°00′
88°50′
88°40′
88°30′
33°40′
CHICKASAW COUNTY
MONROE COUNTY
LOWNDES COUNTY
OKTIBBEHA COUNTY
WEBSTER COUNTY
NATCHEZ TRACE PARKWAY
TOMBIGBEE RIVER
Montpelier
Pheba
WEST POINT
ALT 45
COLUMBUS AND GREENVILLE
ILLINOIS CENTRAL
GULF MOBILE AND OHIO
Houlka Creek
Chuquatonchee Creek
Line Creek
Johnson Creek
Double Creek
Tibbee Creek
Town Creek
Long Branch
Spring Creek
SECTIONALIZED TOWNSHIP
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36
Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION
GENERAL SOIL MAP
CLAY COUNTY, MISSISSIPPI
Scale 1:190,080
1 0 1 2 3 4 Miles



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
CLAY COUNTY, MISSISSIPPI

Scale 1:190,080

1 0 1 2 3 4 Miles

SOIL LEGEND

The first capital letter is the initial one of the soil name. The second position is a lowercase letter for a detailed survey and a capital letter for a reconnaissance survey. The third position, if used, is a capital letter and connotes slope class. Symbols without a slope letter are for nearly level soils, or land types. A final number 2, in the symbol, shows that the soil is eroded.

SYMBOL	NAME
Be	Belden silt loam
Bg	Bigbee loamy sand
BnB	Binnsville silty clay loam, 2 to 6 percent slopes
BrA	Brooksville silty clay, 0 to 1 percent slopes
BrB	Brooksville silty clay, 1 to 3 percent slopes
CaA	Cahaba sandy loam, 0 to 2 percent slopes
CoD	Chalk outcrop-Demopolis complex, 5 to 15 percent slopes
Gr	Griffith silty clay
KpA	Kipling silt loam, 0 to 2 percent slopes
KpB2	Kipling silt loam, 2 to 5 percent slopes, eroded
KpC2	Kipling silt loam, 5 to 8 percent slopes, eroded
Le	Leeper silty clay loam
LoA	Longview silt loam, 0 to 2 percent slopes
LoB	Longview silt loam, 2 to 5 percent slopes
Ma	Mathiston silt loam
MnA	Mayhew silt loam, 0 to 2 percent slopes
OkA	Okolona silty clay, 0 to 1 percent slopes
OkB	Okolona silty clay, 1 to 3 percent slopes
OrB	Ora loam, 2 to 5 percent slopes
OrC2	Ora loam, 5 to 8 percent slopes, eroded
OrD2	Ora loam, 8 to 12 percent slopes, eroded
Oz	Ozan sandy loam
PrA	Prentiss sandy loam, 0 to 2 percent slopes
PrB	Prentiss sandy loam, 2 to 5 percent slopes
RuC	Ruston fine sandy loam, 5 to 8 percent slopes
Se	Sessum silty clay
SRE	Smithdale-Ruston association, hilly
StA	Stough sandy loam, 0 to 2 percent slopes
SuB2	Sumter silty clay, 2 to 5 percent slopes, eroded
SuC2	Sumter silty clay, 5 to 12 percent slopes, eroded
SwC	Sweatman fine sandy loam, 5 to 12 percent slopes
SXE	Sweatman-Smithdale association, hilly
ThB	Tippah silt loam, 2 to 5 percent slopes
TL	Tuscumbia-Leeper association, frequently flooded
Un	Una clay loam
Ur	Urbo silty clay loam
WcB	Wilcox silt loam, 2 to 5 percent slopes
WcC	Wilcox silt loam, 5 to 8 percent slopes
WcD	Wilcox silt loam, 8 to 17 percent slopes

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES
- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)
- Small airport, airfield, park, oilfield, cemetery, or flood pool — Davis Airstrip; FLOOD POOL LINE

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS
- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS
- Interstate — 79
- Federal — 410
- State — 52
- County, farm or ranch — 378

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES
- Without road
- With road
- With railroad

DAMS
- Large (to scale)
- Medium or small — water; w

PITS
- Gravel pit — G.P.
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES
- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — GAS
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE
- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS
- Perennial — water; w
- Intermittent — Int; i

MISCELLANEOUS WATER FEATURES
- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot
- Sewage lagoon — S.L.

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — CeA FoB2

ESCARPMENTS
- Bedrock (points down slope)
- Other than bedrock (points down slope)

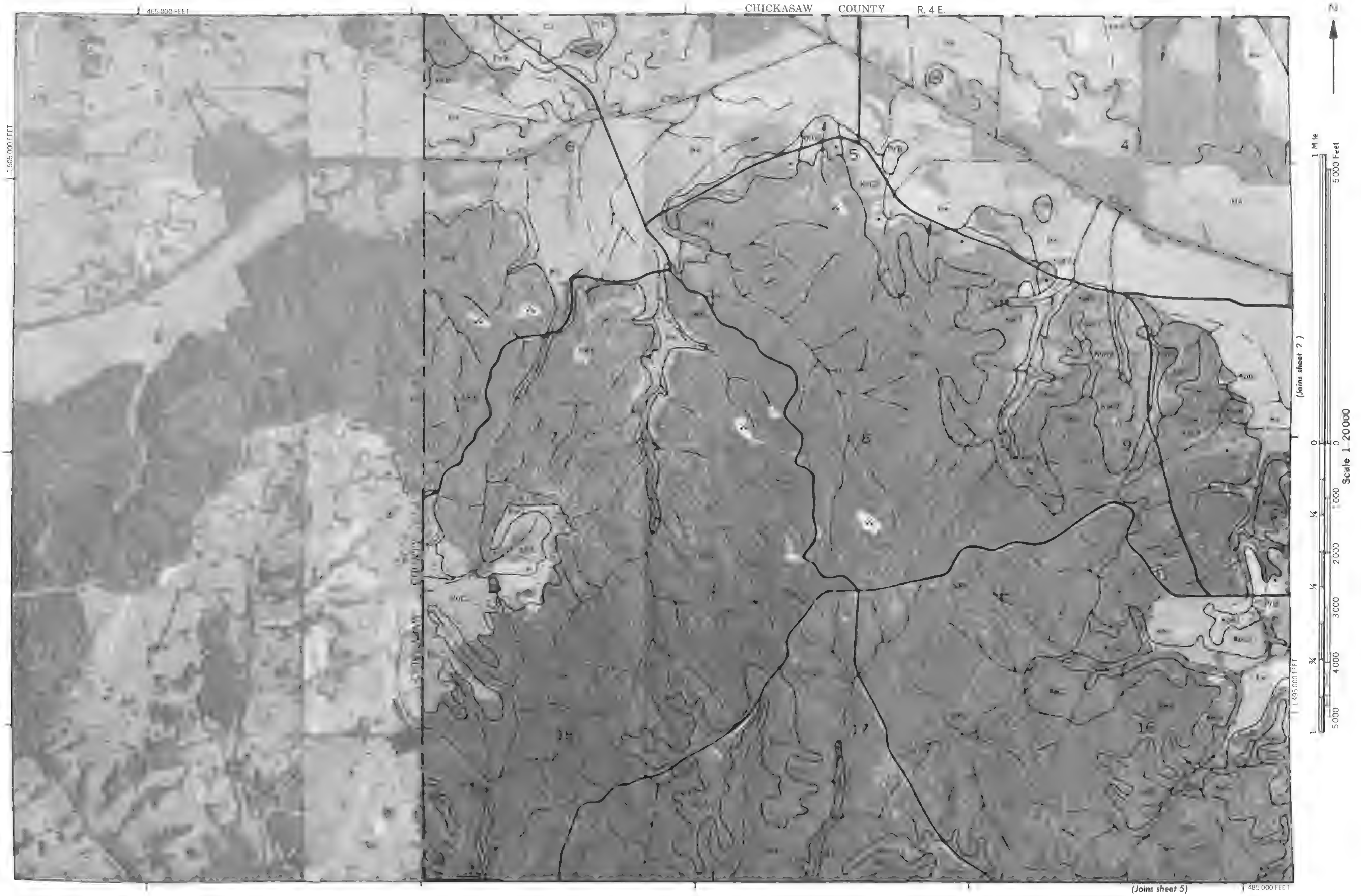
SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown) — S

MISCELLANEOUS
- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Lime pit — L.P.



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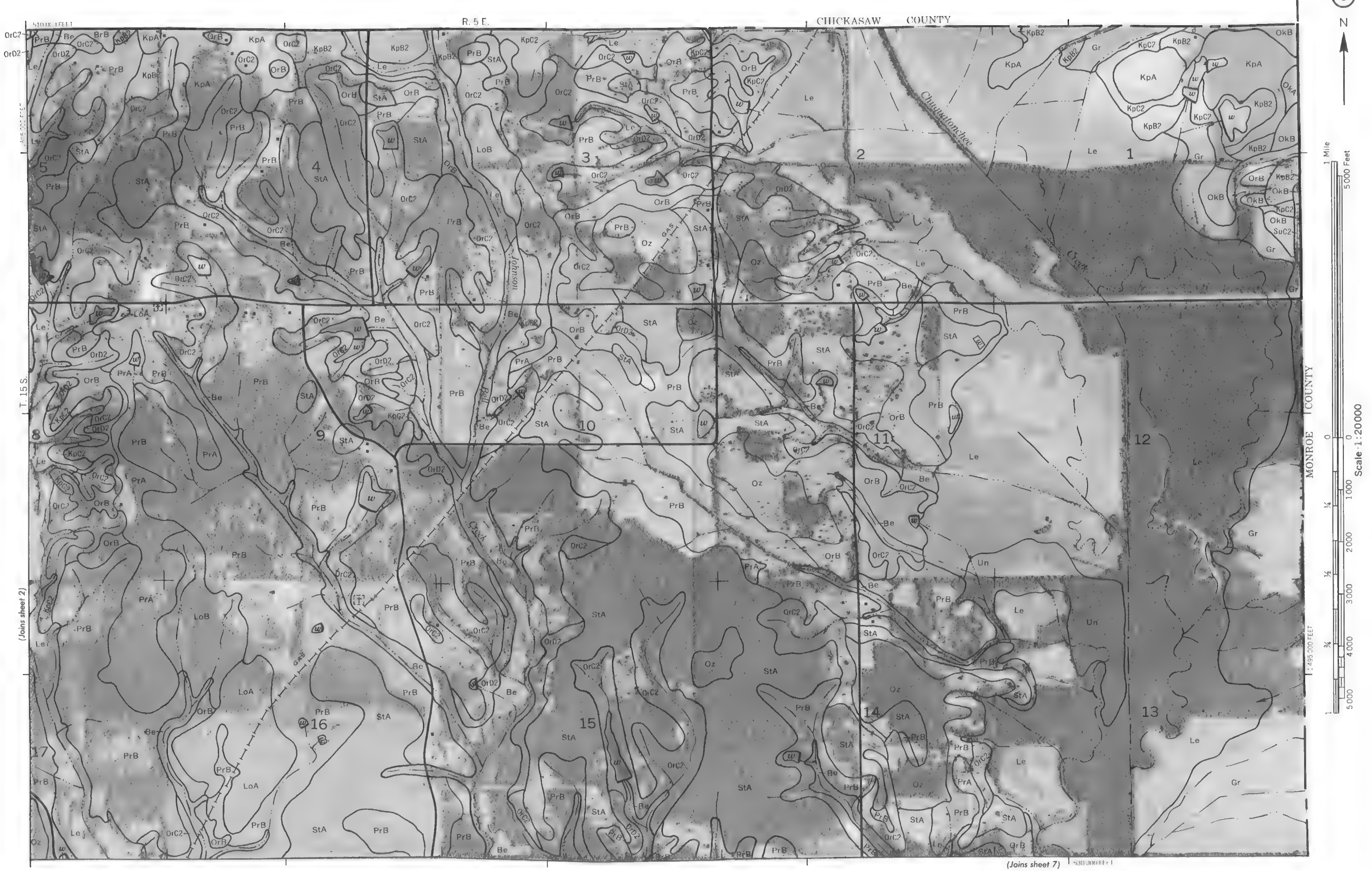
CLAY COUNTY, MISSISSIPPI NO. 1

CLAY COUNTY, MISSISSIPPI NO. 2



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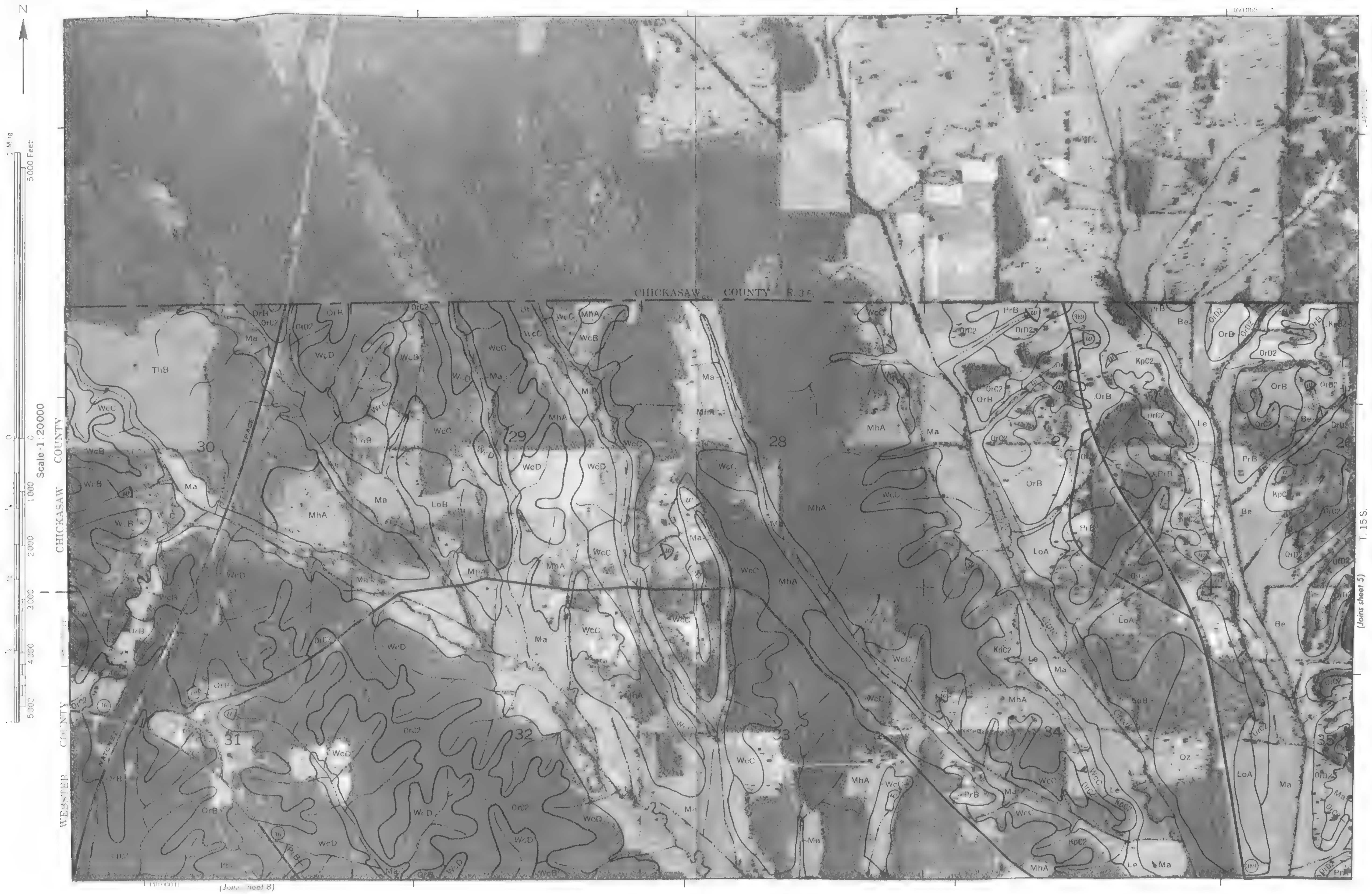

CLAY COUNTY, MISSISSIPPI NO. 4

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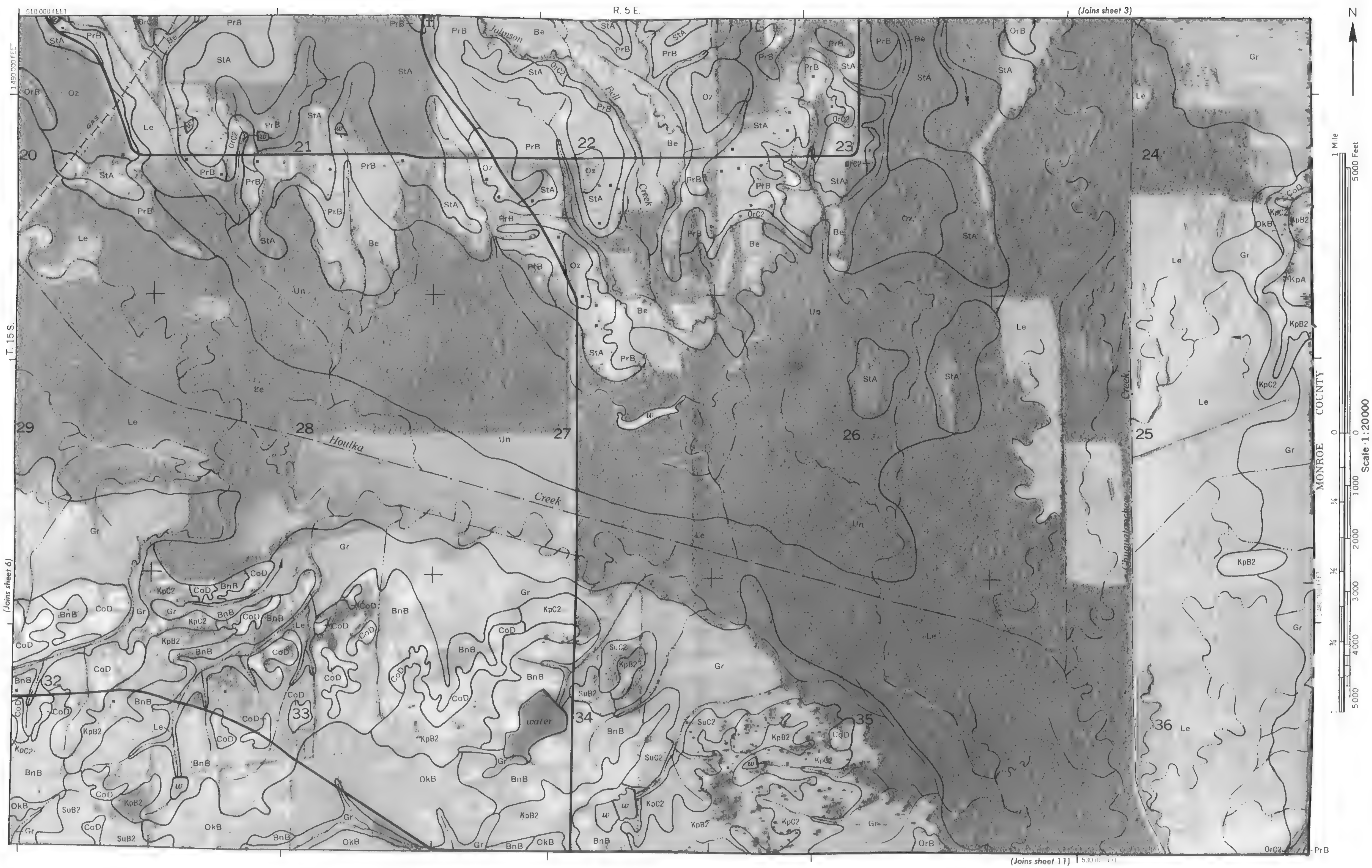
CLAY COUNTY, MISSISSIPPI NO. 5

CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 6

CLAY COUNTY, MISSISSIPPI NO. 6



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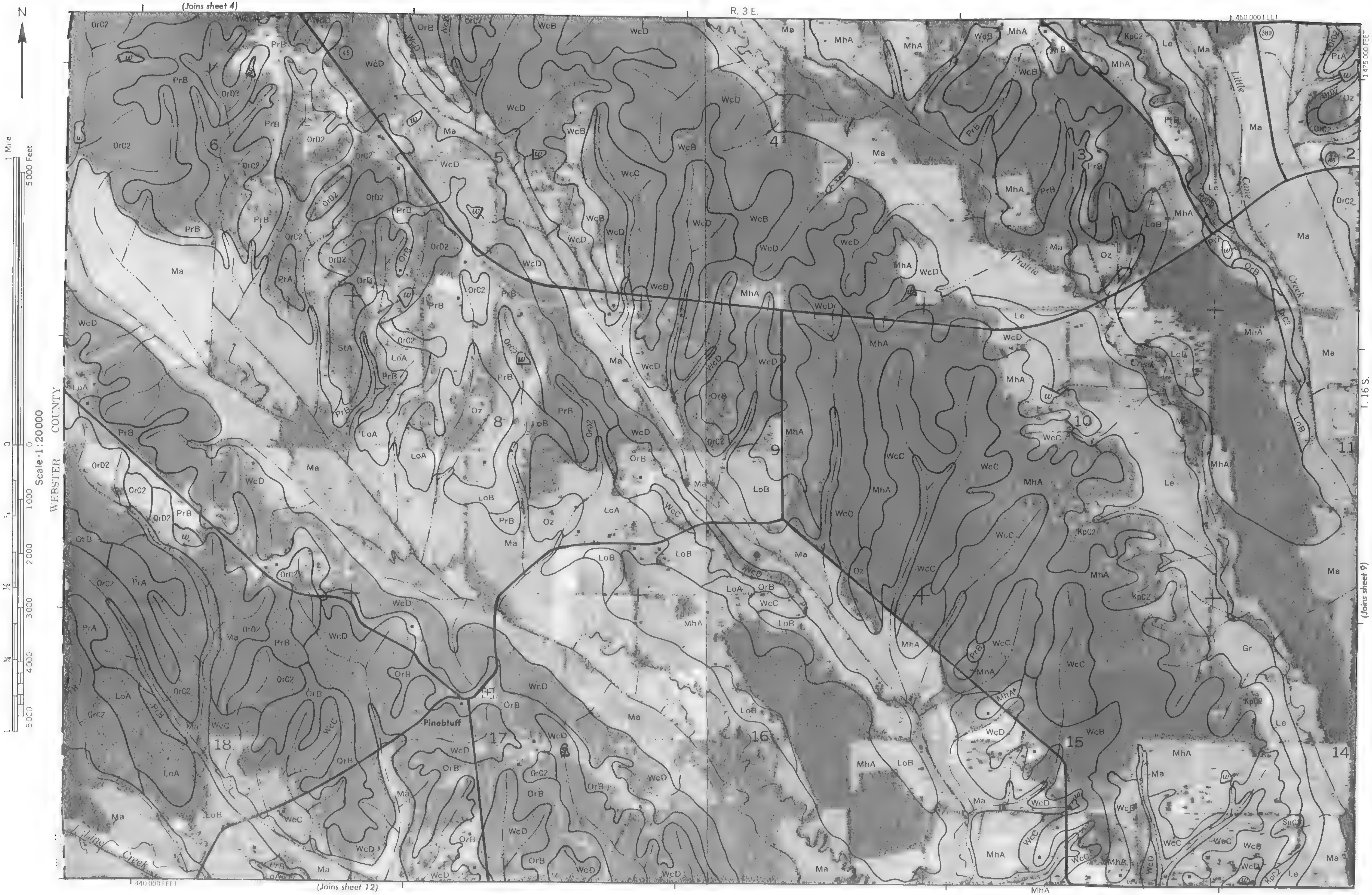
CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 8

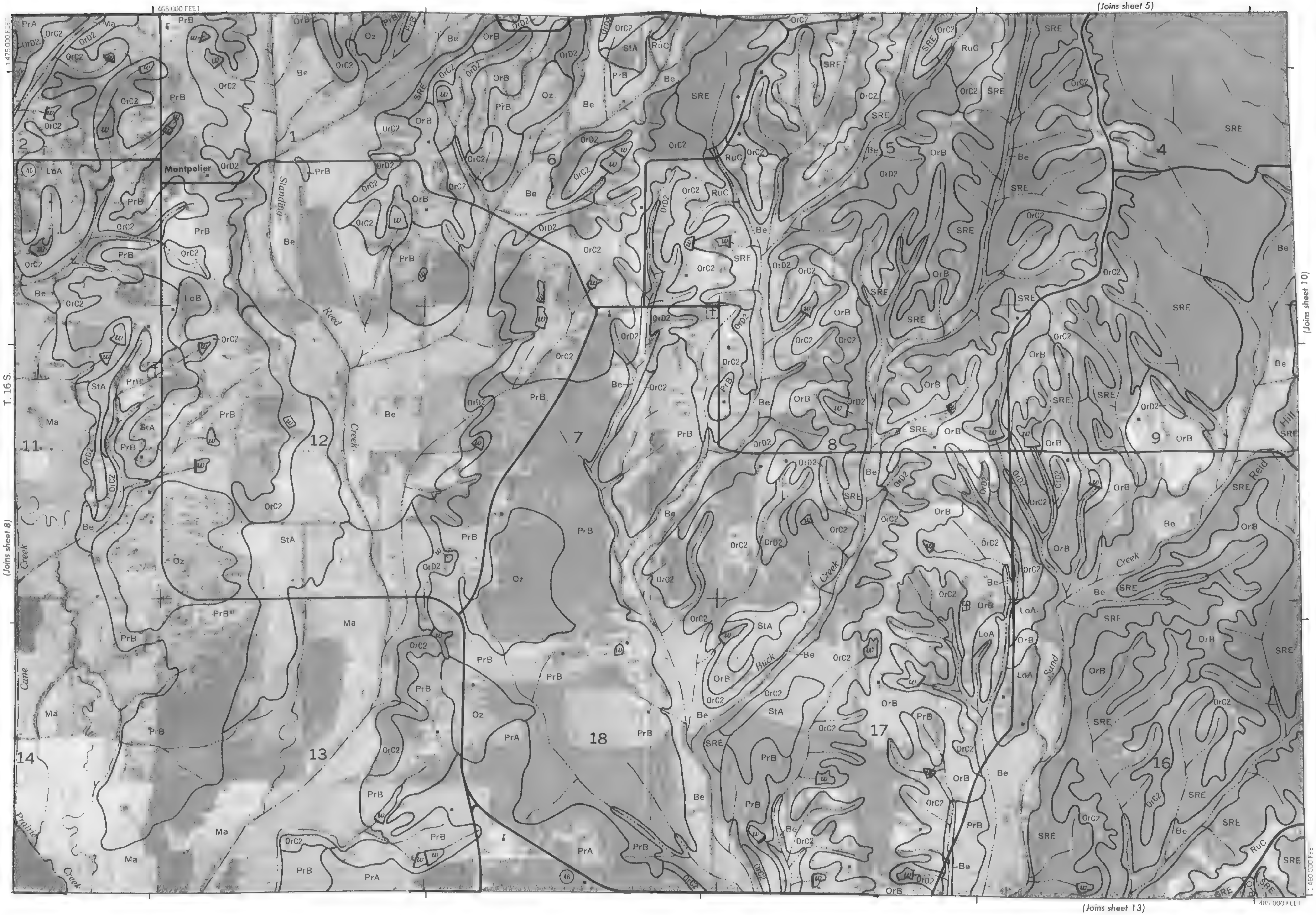


CLAY COUNTY, MISSISSIPPI NO. 8

CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 9

R. 3 E. | R. 4 E.

(9)



N

Scale 1:20 000

1 Mile
5000 Feet

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CLAY COUNTY, MISSISSIPPI NO. 9

CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 10

CLAY COUNTY, MISSISSIPPI NO. 10

CLAY COUNTY, MISSISSIPPI NO. 11

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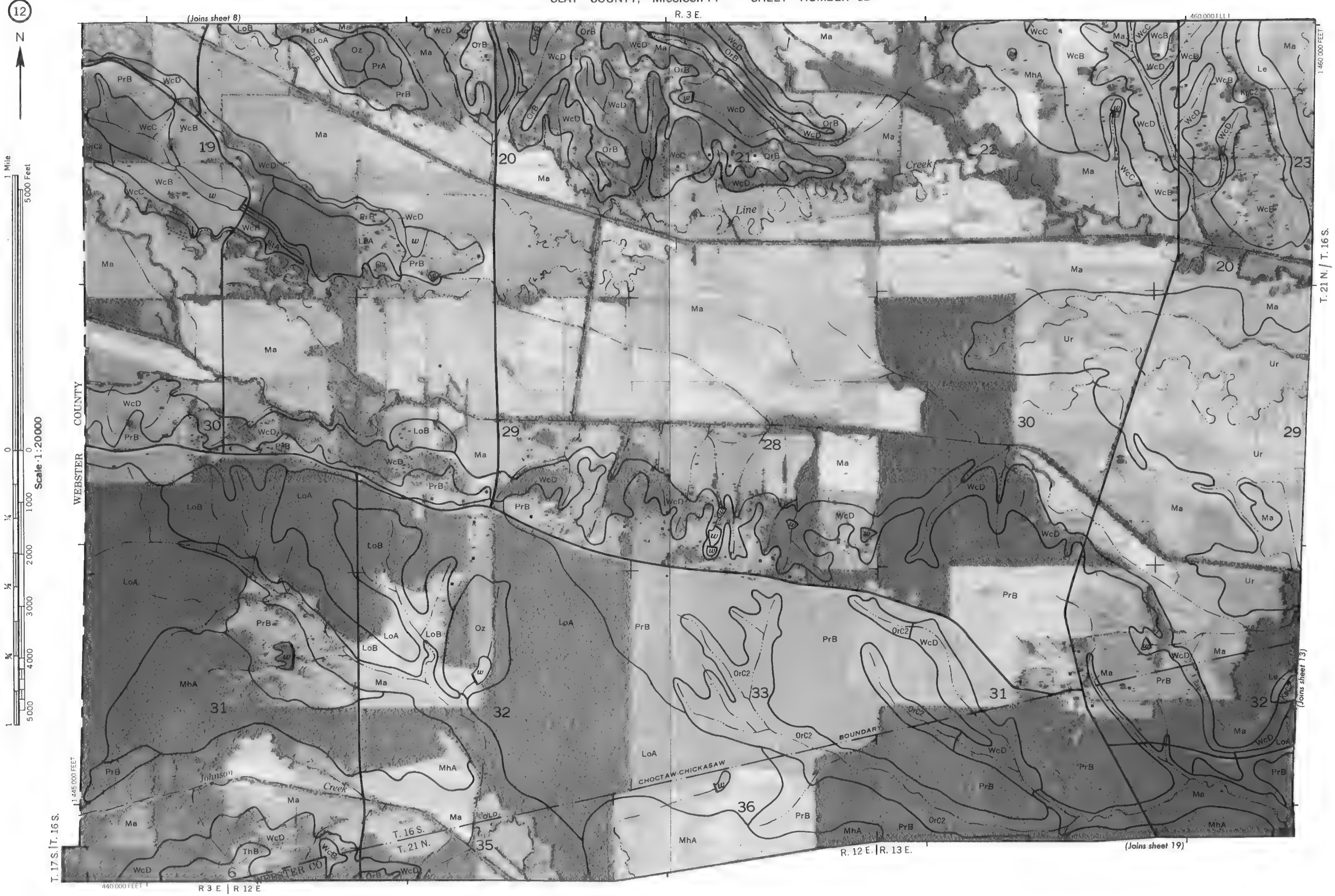
CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 12



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CLAY COUNTY, MISSISSIPPI NO. 13

CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 14

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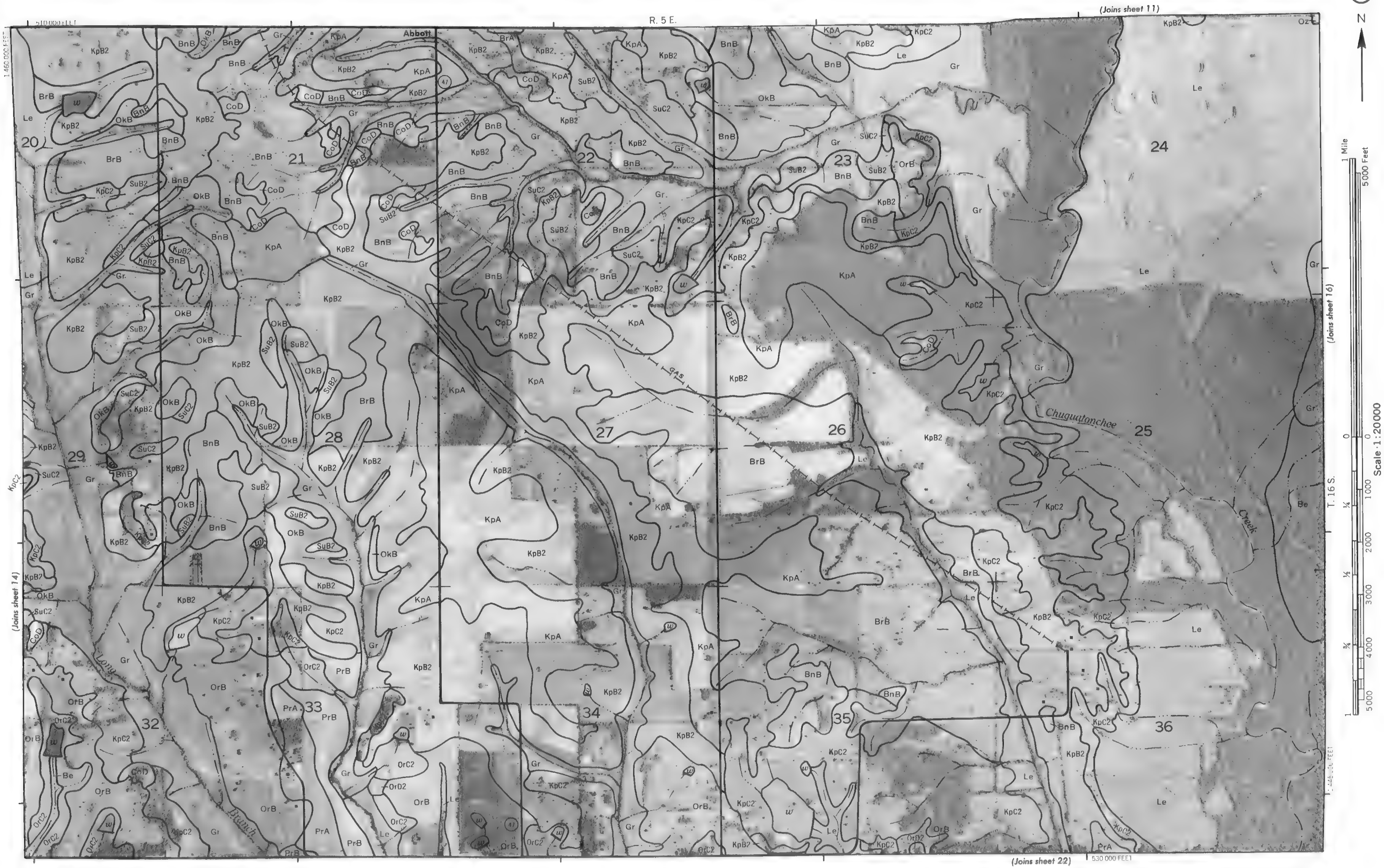


This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLAY COUNTY, MISSISSIPPI NO. 15

CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 16

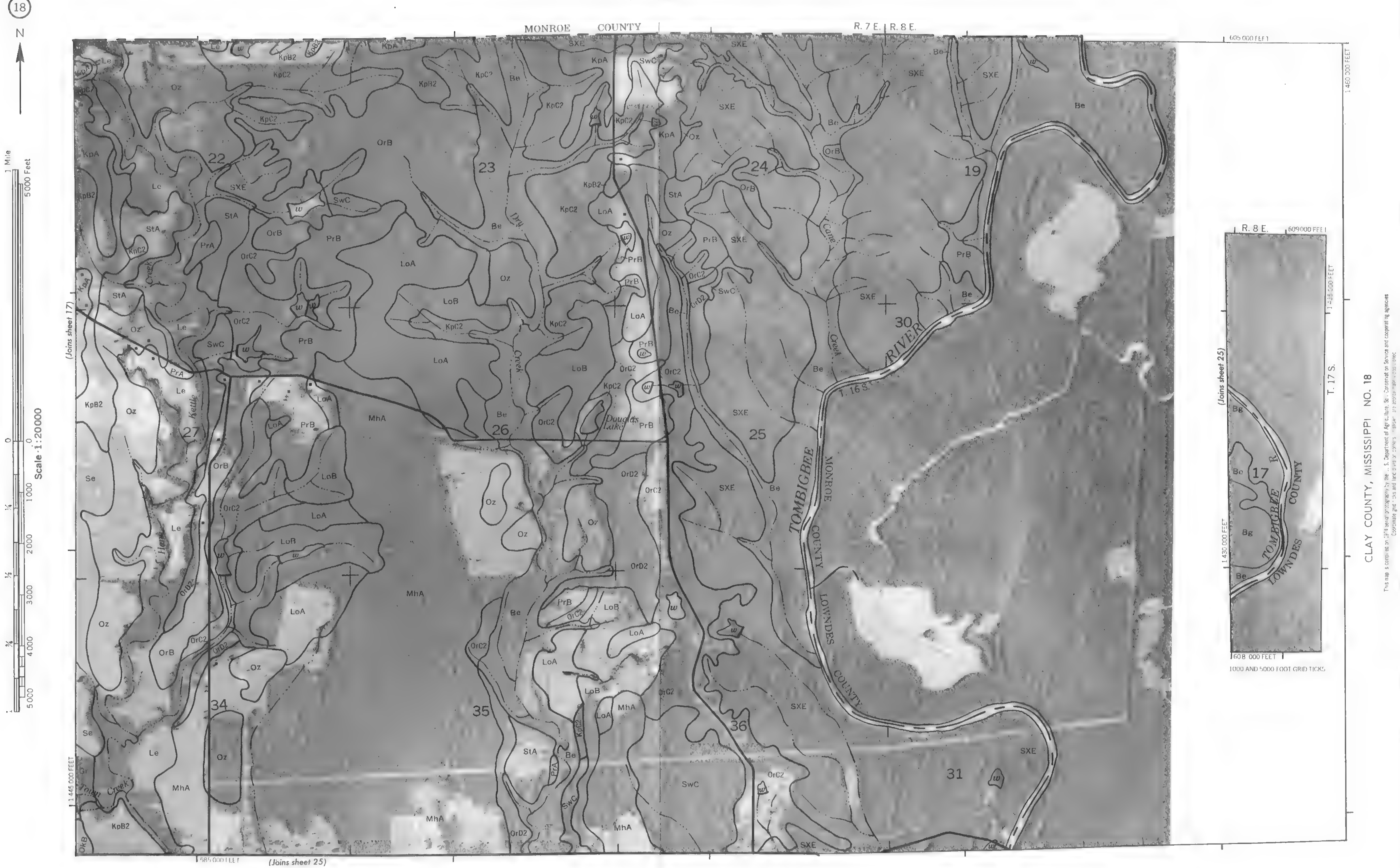
CLAY COUNTY, MISSISSIPPI NO. 16

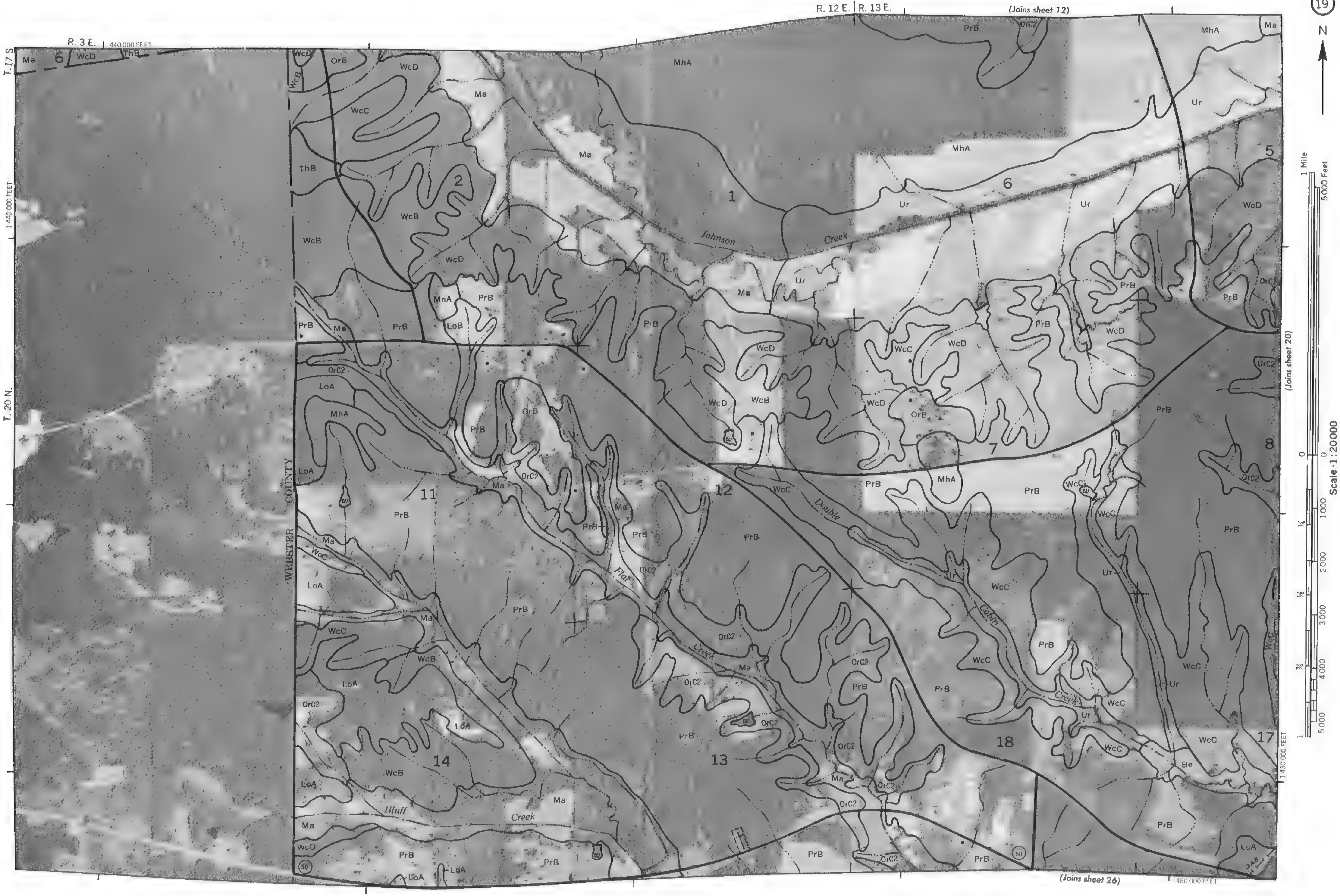
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLAY COUNTY, MISSISSIPPI NO. 17

CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 18





This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

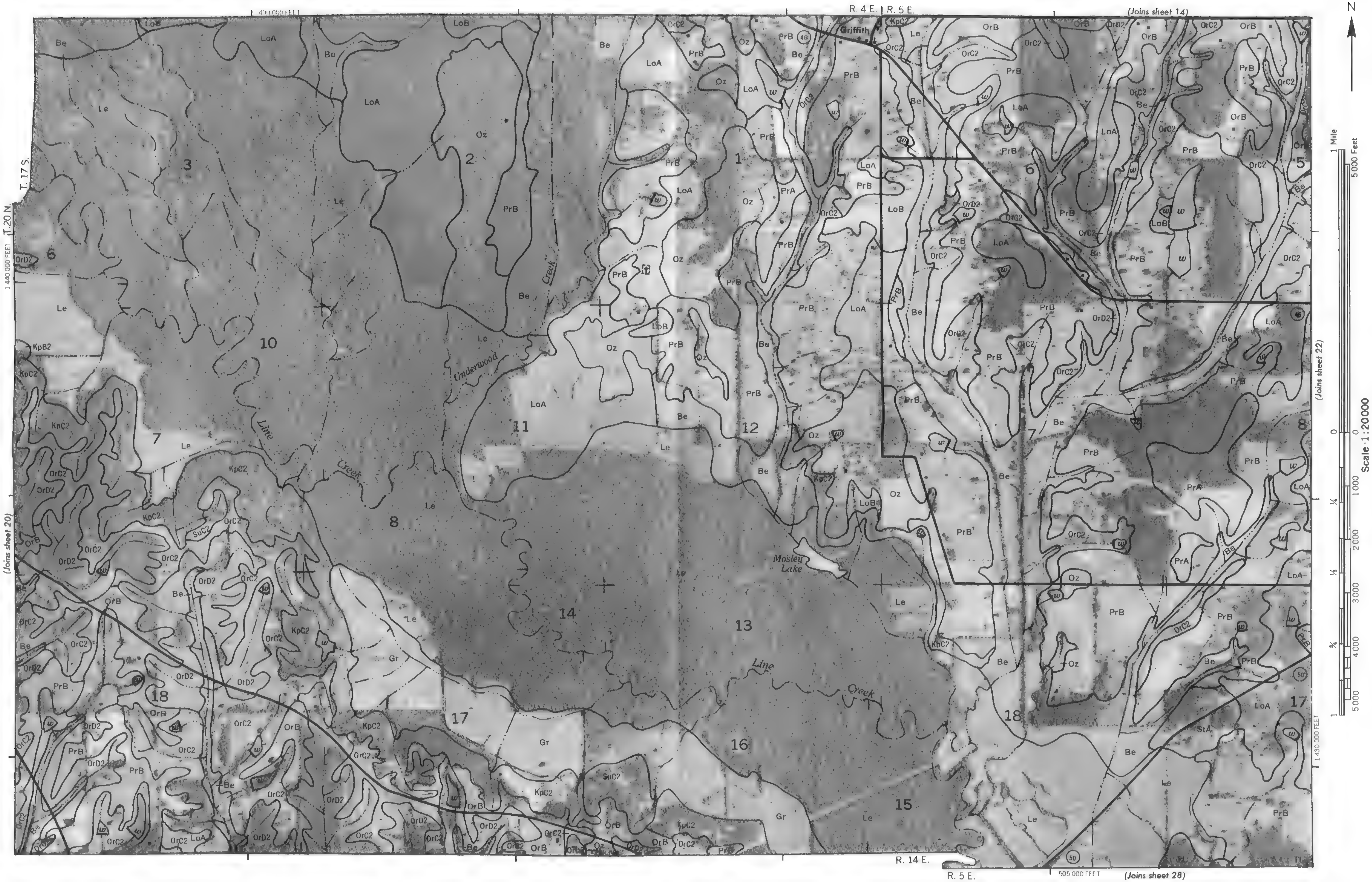
CLAY COUNTY, MISSISSIPPI NO. 19

CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 20

CLAY COUNTY, MISSISSIPPI NO. 20

This map is compiled on [illegible] aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

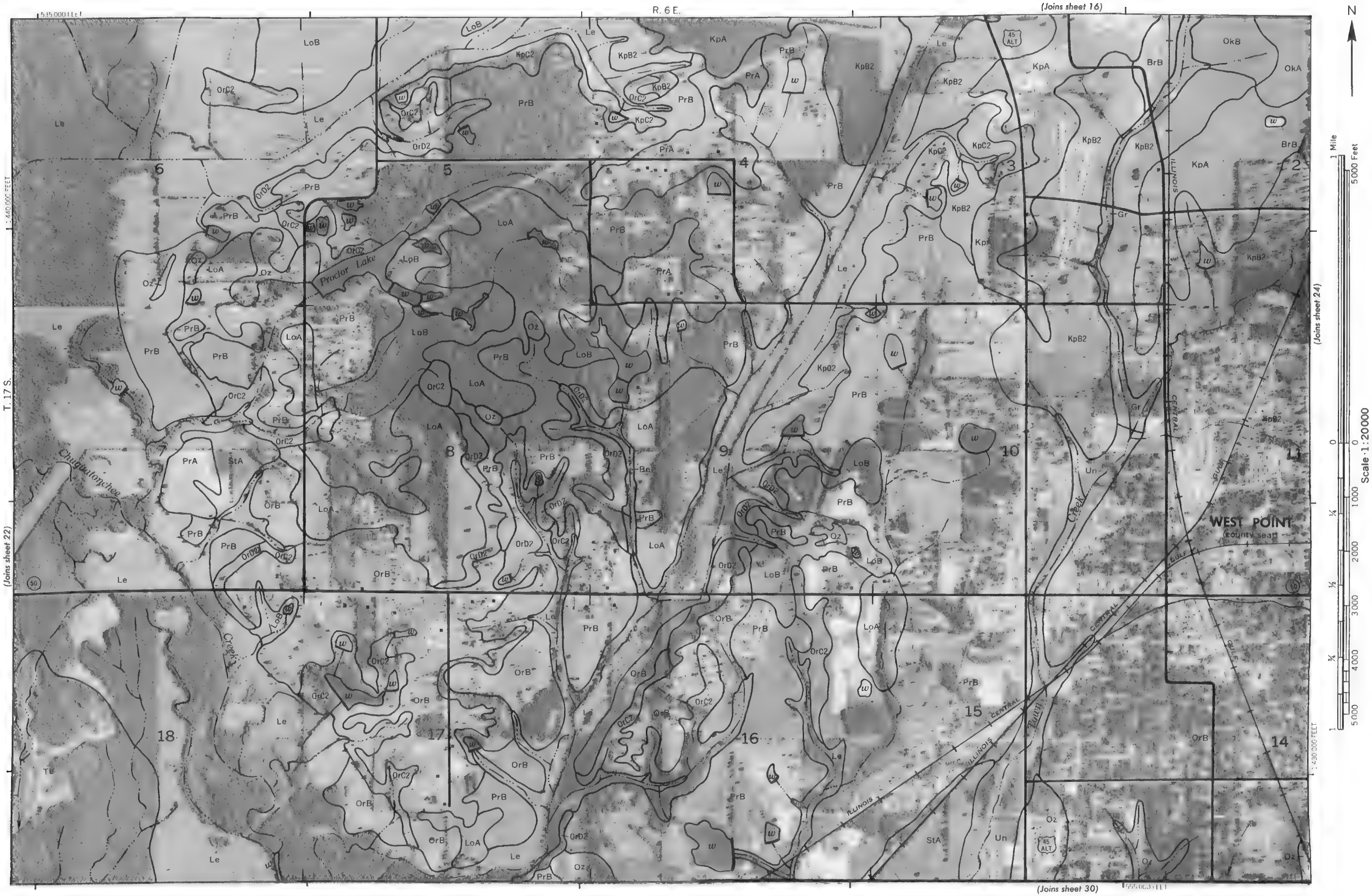
(21)



CLAY COUNTY, MISSISSIPPI NO. 21

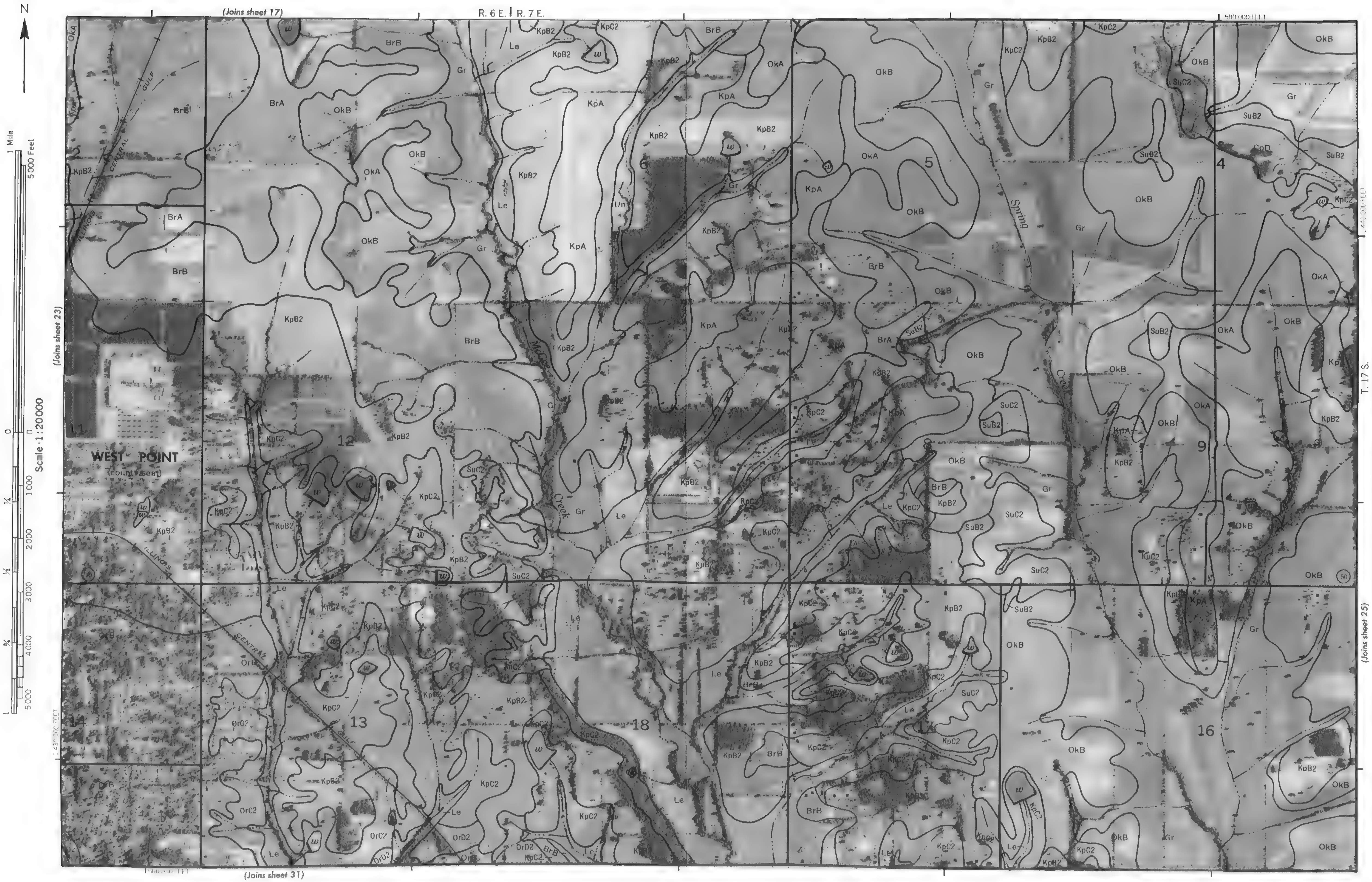
This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.


22
N
(Joins sheet 15)
R. 5 E.
Siloam
Long
Branch
Walker Lake
(Joins sheet 21)
(Joins sheet 29)
510 000 FEET
530 000 FEET
1 430 000 FEET
Scale 1:20000
1 Mile
5000 Feet
0
¼
½
¾
1
1000
2000
3000
4000
5000
3
4
5
8
9
10
11
12
13
14
15
16
17
OrB
OrC2
OrD2
KpC2
KpB2
KpA
PrA
PrB
LoA
LoB
Be
Le
Gr
CoD
SuC2
Oz
Tl

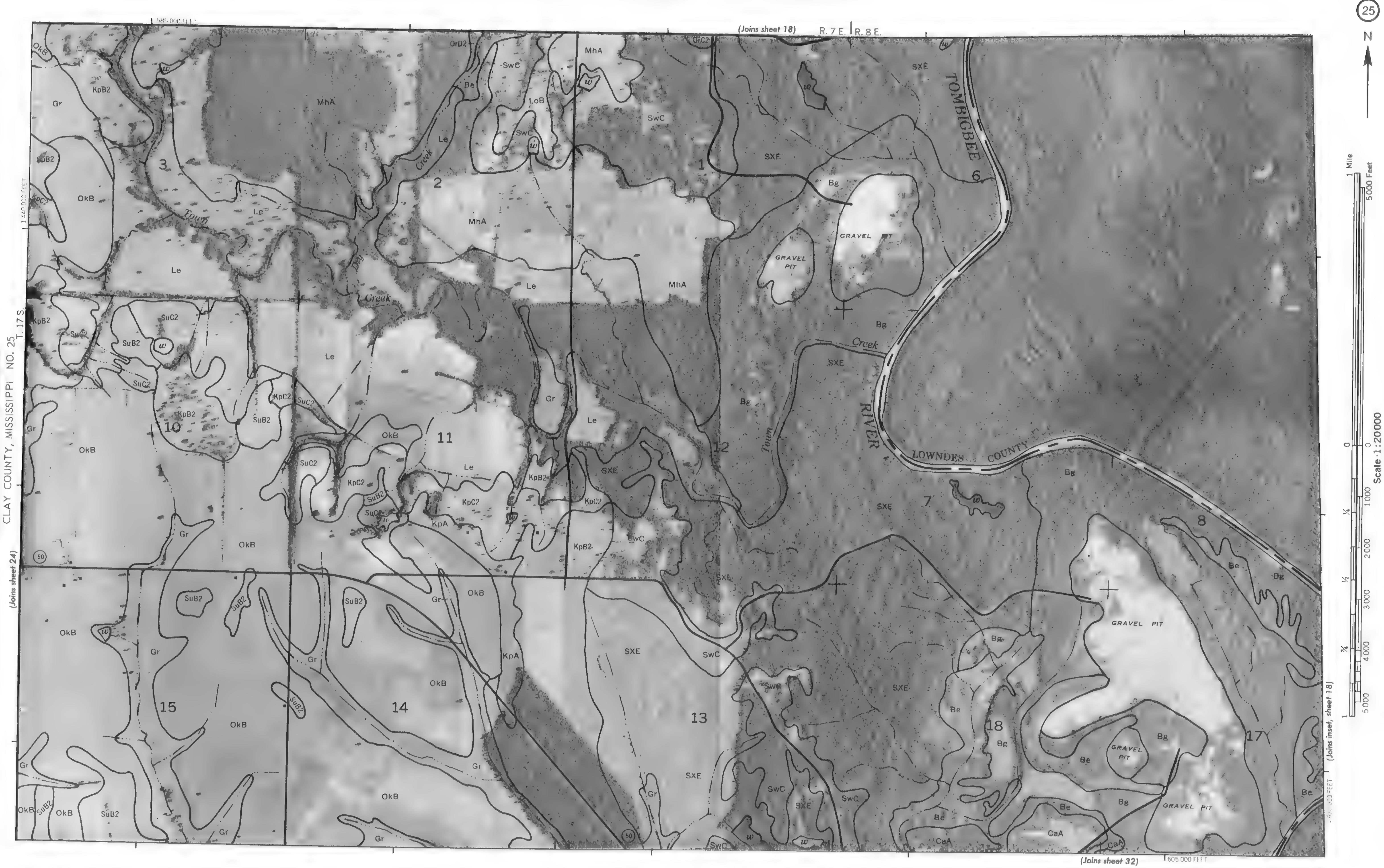


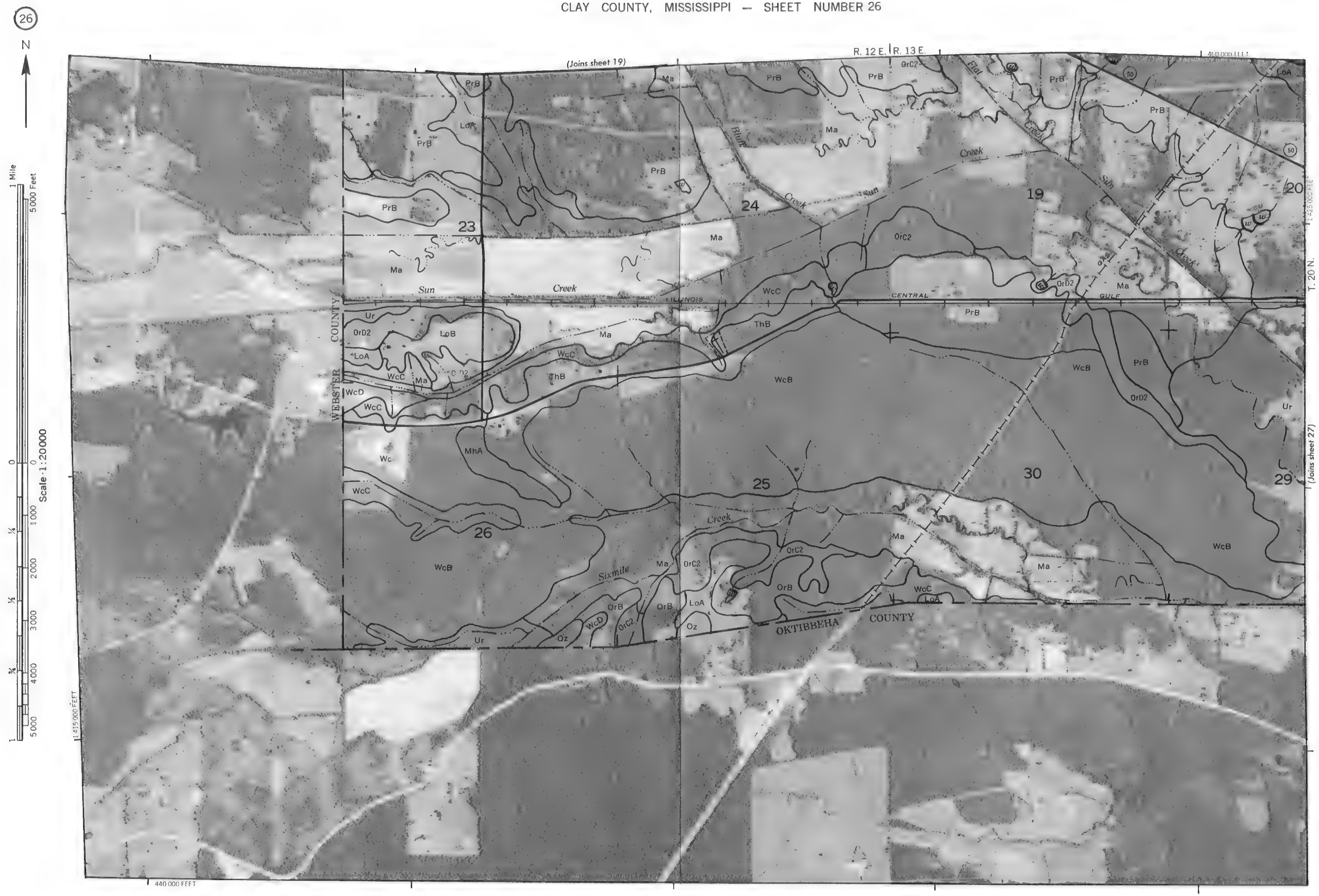
CLAY COUNTY, MISSISSIPPI NO. 23

CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 24



CLAY COUNTY, MISSISSIPPI NO. 24


25
N
(Joins sheet 18)
R. 7 E.
R. 8 E.
(Joins sheet 24)
CLAY COUNTY, MISSISSIPPI NO. 25
T. 17 S.
(Joins sheet 32)
(Joins inset, sheet 18)
1 440 000 FEET
605 000 FEET
TOMBIGBEE
RIVER
LOWNDES COUNTY
Town Creek
Dry Creek
Creek
GRAVEL PIT
MhA
OkB
Gr
KpB2
SuB2
SuC2
KpC2
Le
LoB
SwC
Be
Bg
SXE
KpA
CaA
OrD2
1
2
3
6
7
8
10
11
12
13
14
15
17
18
1 Mile
5000 Feet
Scale 1:20000
0
1000
2000
3000
4000
5000
¼
½
¾

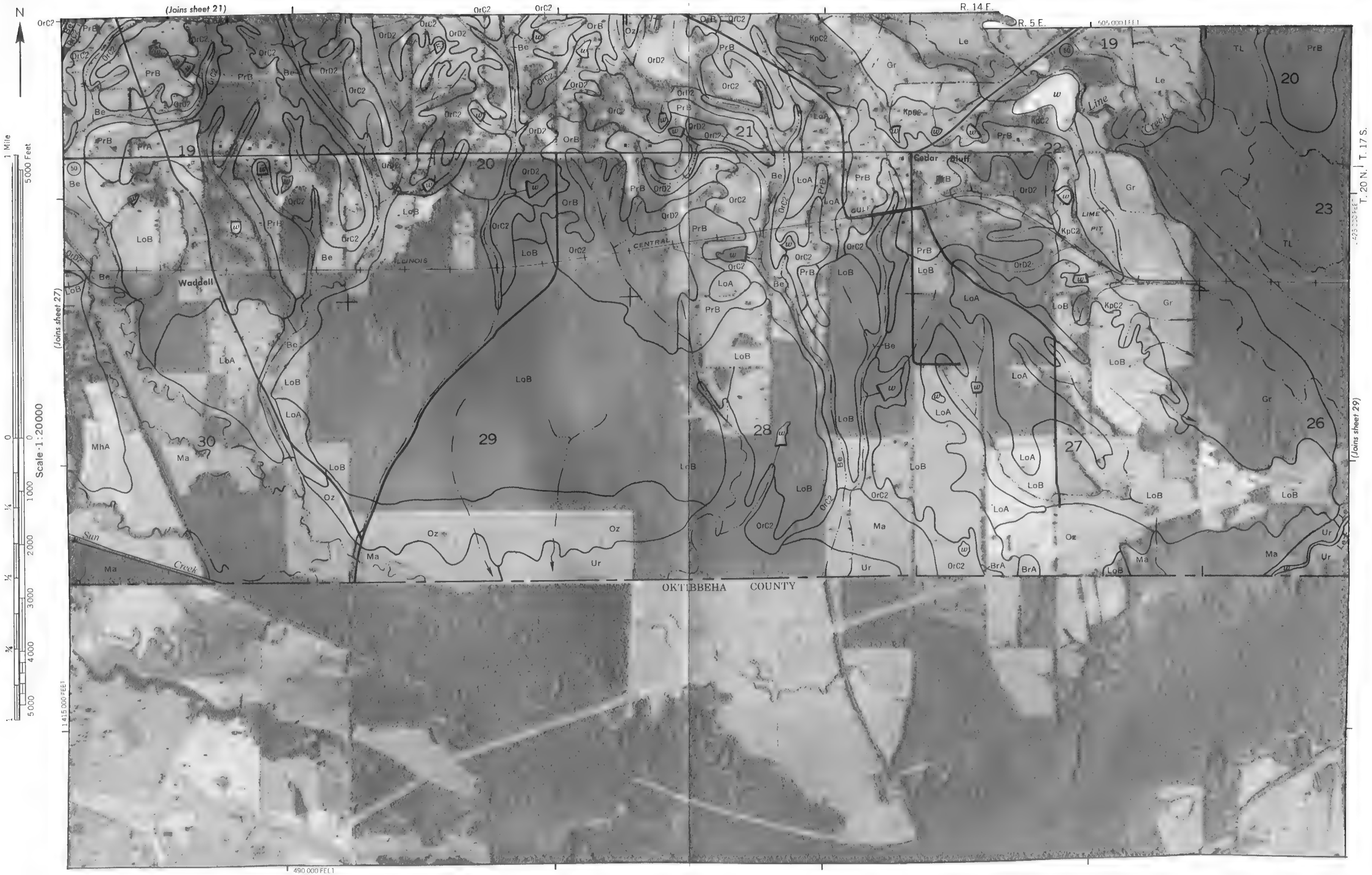


CLAY COUNTY, MISSISSIPPI NO. 26

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

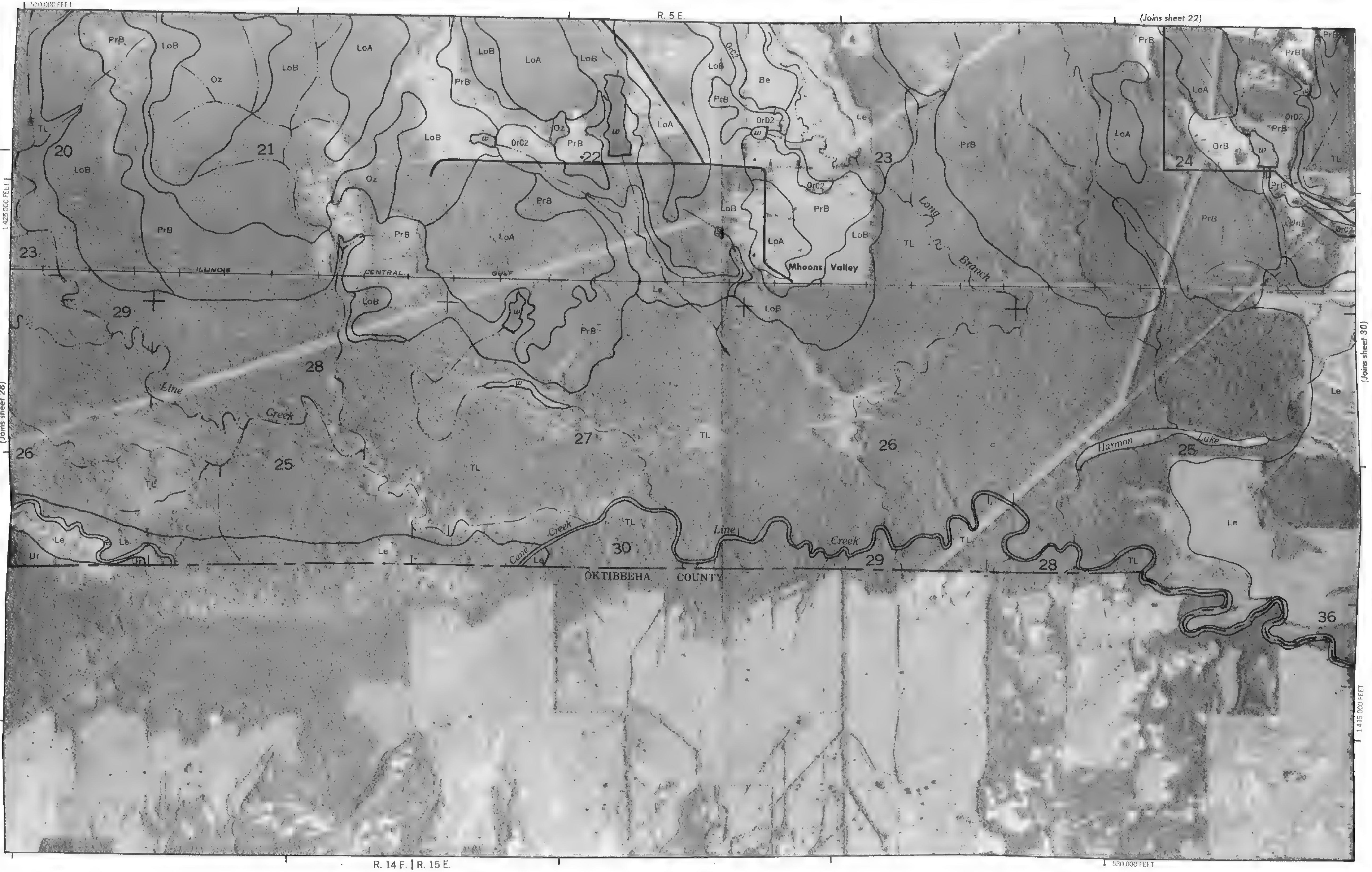
CLAY COUNTY, MISSISSIPPI NO. 27

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.


N
1 Mile
5000 Feet
Scale 1:20000
(Joins sheet 21)
(Joins sheet 27)
(Joins sheet 29)
R. 14 E.
R. 5 E.
T. 20 N.
T. 17 S.
505 000 FEET
490 000 FEET
1 415 000 FEET
Waddell
Cedar Bluff
CENTRAL
GULF
ILLINOIS
LIME PIT
Line Creek
Sun Creek
OKTIBBEHA COUNTY
19
20
21
22
23
26
27
28
29
30
LoB
LoA
PrB
OrC2
OrD2
OrB
Be
Oz
Ma
MhA
Ur
Gr
Le
TL
KpC2
BrA

29

N

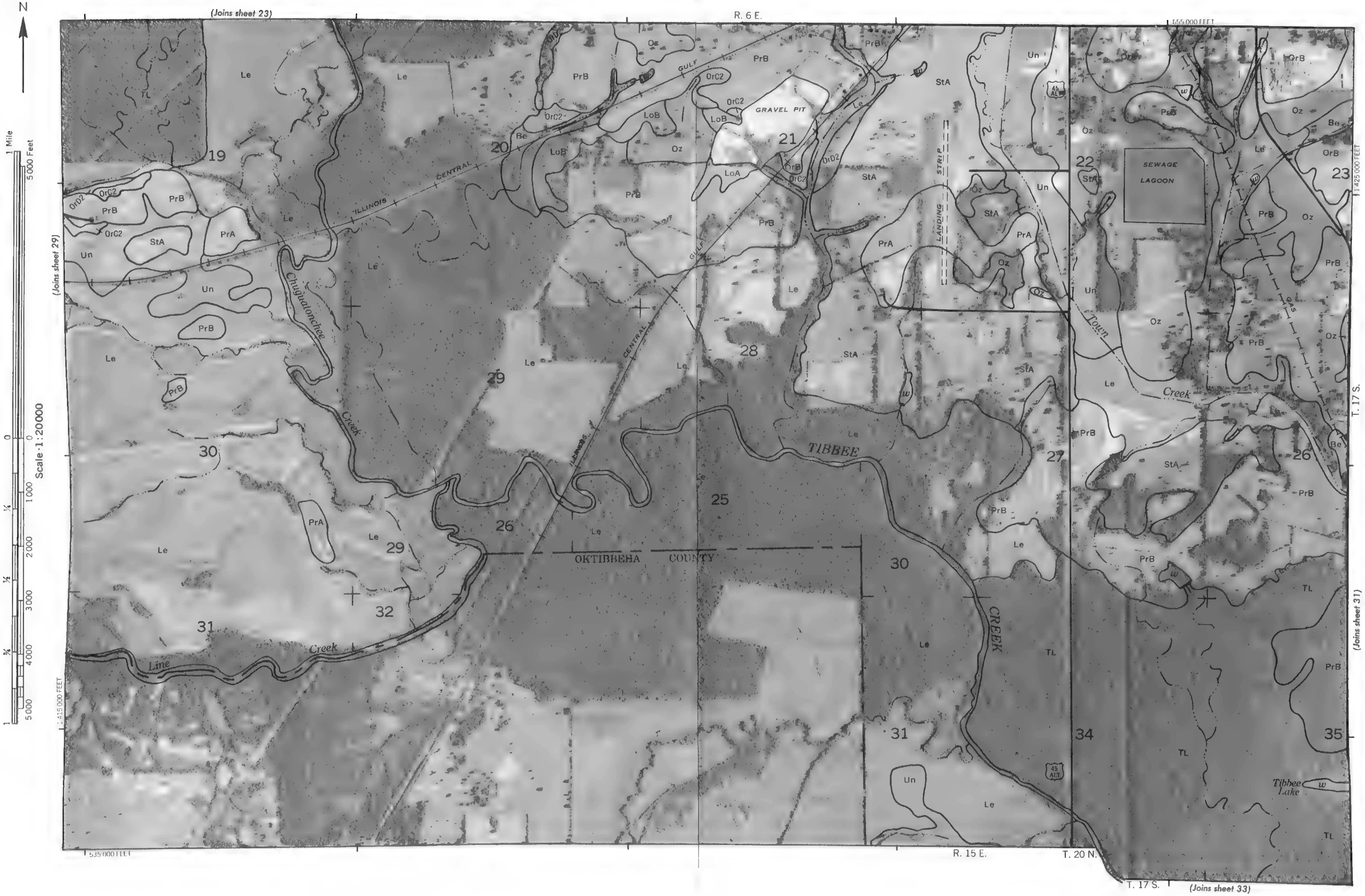


1 Mile
5 000 Feet
0
¼
½
¾
1
0
1 000
2 000
3 000
4 000
5 000
Scale 1:20000

CLAY COUNTY, MISSISSIPPI NO. 29

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

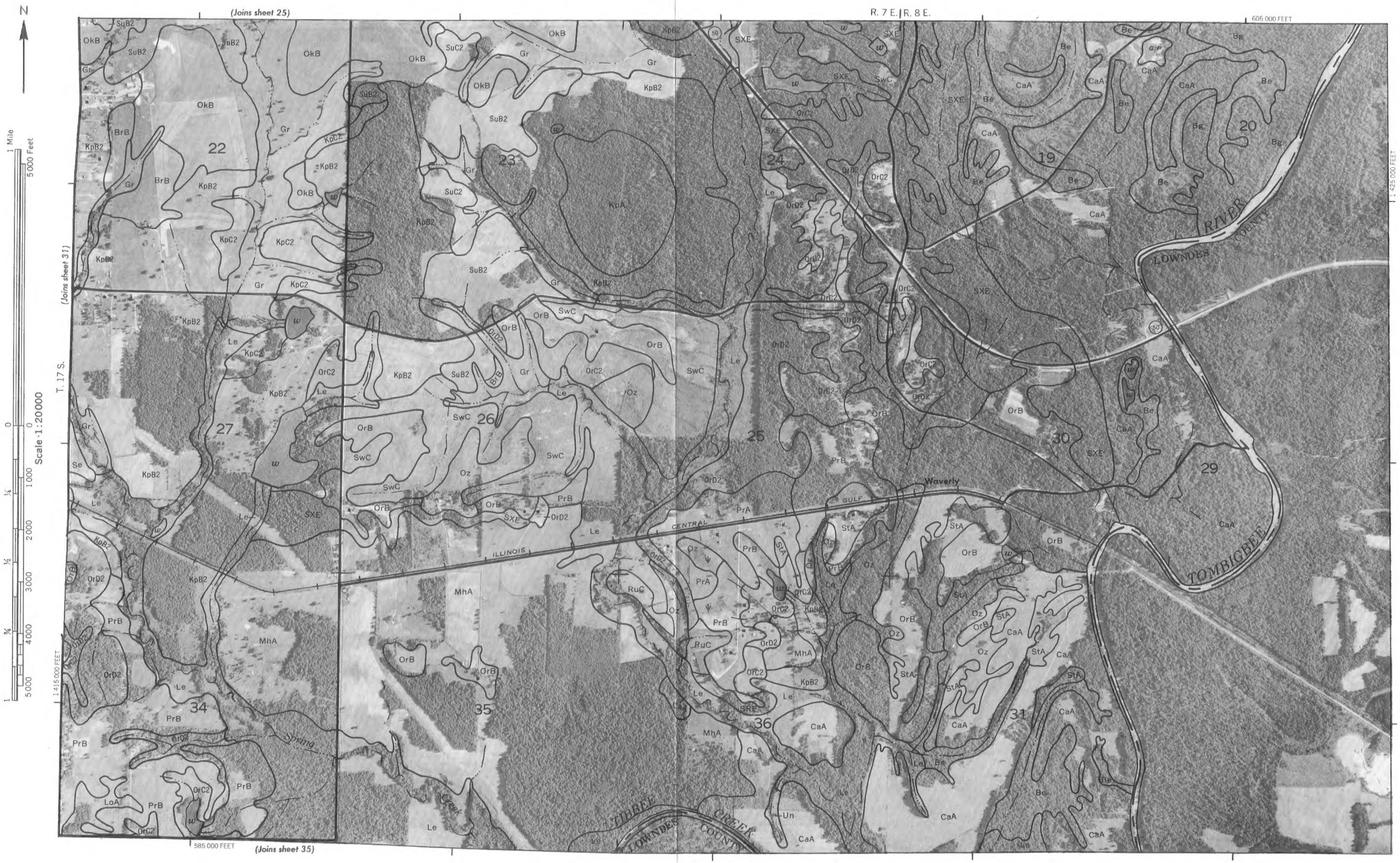
CLAY COUNTY, MISSISSIPPI — SHEET NUMBER 30



This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLAY COUNTY, MISSISSIPPI NO. 31

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

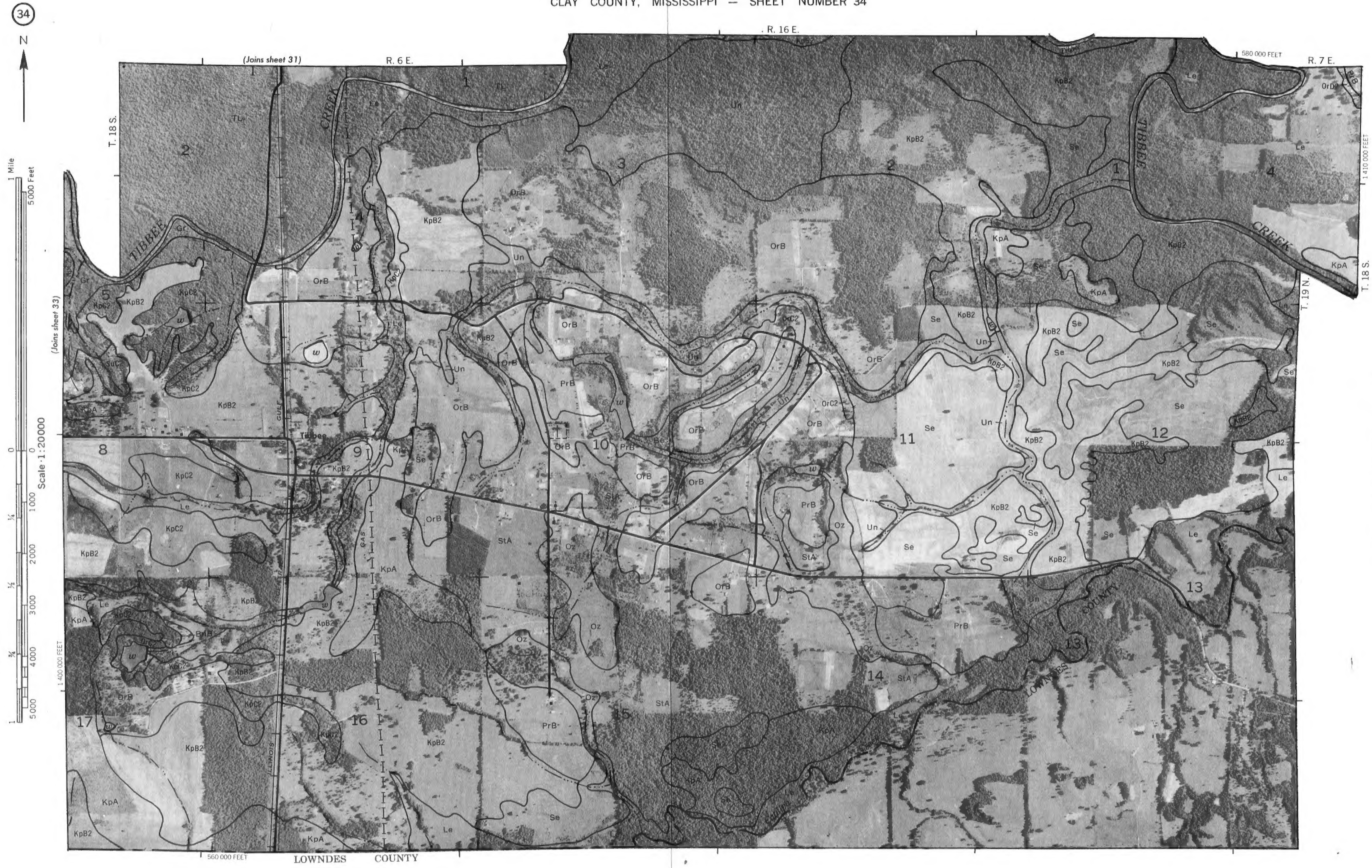


This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLAY COUNTY, MISSISSIPPI NO. 32

CLAY COUNTY, MISSISSIPPI NO. 33

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



CLAY COUNTY, MISSISSIPPI NO. 34

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CLAY COUNTY, MISSISSIPPI NO. 35

This map is compiled on 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.